Joint Service CB Defense
Research, Development and Acquisition Plan

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Joint Service Materiel Group

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JOINT SERVICE CHEMICAL AND BIOLOGICAL DEFENSE RESEARCH, DEVELOPMENT, AND ACQUISITION PLAN

The Joint Service CB Defense RDA Plan articulates the way forward for the total CB defense program and defines a fully coordinated and integrated investment strategy strongly supported throughout the Department of Defense. Our goal is to ensure full dimensional protection for all our Servicemen and women operating under the threat of continued proliferation of weapons of mass destruction.

Chairman,
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List of Acronyms

AARS	Advanced Airborne RADIAC System
ABMS	Automated Battlefield Management System
ABPDS	Portal Shield-Airbase/Port Detector System
ACADA	Automatic Chemical Agent Detector and Alarm
ACPLA	Agent Containing Particles per Liter of Air
ACPM	Aircrew Protective Mask
ACTD	Advanced Concept Technology Demonstration
ADCPE	Advanced Deployable Collective Protection Equipment
AERP	Aircrew Eye/Respiratory Program
AFRRI	Armed Forces Radiobiology Research Institute
AICPS	Advanced Integrated Collective Protective System
APOD	Aerial Ports of Debarkation
APPJ	Atmospheric Pressure Plasma Jet
ASBREM	Armed Services Biomedical Research Evaluation and Management Committee
ATD	Advanced Technology Demonstration
ATNAA	Antidote Treatment – Nerve Agent Autoinjector
ANL	Argonne National Laboratory
BA	Budget Activity
BD	Biological Defense
BDO	Battle Dress Overgarment
BDU	Battle Dress Uniform
BES	Budget Estimate Submission
BIDS	Biological Integrated Detection System
BIG	Botulinum Immune Globulin
BuChE	Butyrylcholinesterase
BVO	Black Vinyl Overboot
BW	Biological Warfare
C2	Command and Control
C3I	Command, Control, Communications, and Intelligence
C4I	Command, Control, Communications, Computers, and Intelligence
C4I2	Command, Control, Communications, Computers, Information and Intelligence
C4ISR	Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance
CA	Contamination Avoidance
CALCM	Conventional Air-Launched Cruise Missile
CAM	Commodity Area Manager
CAM	Chemical Agent Monitor
CANA	Convulsant Antidote for Nerve Agent
CAPDS	Chemical Agent Point Detection System
CASPOD	Contamination Avoidance for Sea Port of Debarkation
CATS	Consequences Assessment Tool Set
CB	Chemical Biological

CBD	Chemical Biological Defense
CBDP MGT	Chemical Biological Defense Program Management
CBIS	Chemical Biological Individual Sampler
CBMS	Chemical Biological Mass Spectrometer
CBNP	Chemical and Biological Nonproliferation Program
CBPS	Chemical Biological Protective Shelter
CB-RRT	Chemical Biological Rapid Response Team
CBR	Chemical Biological Radiological
CBRIDS	Chemical Biological Radiological Identification and Diagnosis System
CBRS - AC	Chemical Biological Respiratory System - Aircrew
CHATH	Chemically Hardened Air Transportable Hospital
CINC	Commander in Chief
CIS	Chemical Imaging System
CMR	Chloroform-Methanol Residue
CoM	Consequence Management
CONOPS	Concept of Operations
CONUS	Continental United States
COTS	Commercial Off The Shelf
CP	Collective Protection
CP	Counterproliferation
CP DEPMEDS	Collectively Protected Deployable Medical System
CPE	Collective Protection Equipment
CPOG	Chemical Protective Overgarment
CPS	Collective Protection System
CPSBKFT	Collective Protection System Amphibious Backfit
CRP	Critical Reagents Program
CW	Chemical Warfare
CWA	Chemical Warfare Agent
CWNAVSIM	Chemical Warfare Naval Simulation
DAP	Decontamination Apparatus Portable
DARPA	Defense Advanced Research Projects Agency
DBOF	Defense Business Operating Funds
DDAP	Domestic Demonstration and Application Program
DEPMEDS	Deployable Medical Systems
DIS	Distributed Interactive Simulation
DLA	Defense Logistics Agency
DNA	Deoxyribonucleic Acid
DoD	Department of Defense
DOE	Department of Energy
DOJ	Department of Justice
DP	Domestic Preparedness
DPG	Dugway Proving Ground
DS-2	Decontamination Solution - 2
DTO	Defense Technology Objective
DTRA	Defense Threat Reduction Agency
DU	Depleted Uranium

EEE	Eastern Equine Encephalitis
EOD	Explosive Ordinance Disposal
FCS	Future Combat System
FDA	Food and Drug Administration
FDDS	Forward Deployable Diagnostic System
FP	Force Protection
FPA	Focal Plane Array
FSCS	Future Scout and Cavalry System
FY	Fiscal Year
GC/MS	Gas Chromatography/Mass Spectrometry
GCCS	Global Command and Control System
GP	General Protection
GRIDGEN	Grid Generator
GVO	Green Vinyl Overboots
HEPA	High Efficiency Particulate Arresting
HMMWV	High Mobility Multipurpose Wheeled Vehicle
HPT	Hazard Prediction Tool
HRAM	Health Risk Assessment Model
IAEC	International Atomic Energy Commission
IAV	Interim Armored Vehicle
IBADS	Interim Biological Agent Detector System
ICAD	Individual Chemical Agent Detector
ICAM	Individual Chemical Agent Monitor
IED	Improvised Explosive Devices
IOC	Initial Operational Capability
IP	Individual Protection
IPDS	Improved (Chemical Agent) Point Detection System
IT	Intratracheal
ITAP	Improved Toxicological Agent Protective
JADS	Joint Advanced Decontamination System
JAO	Joint Acquisition Objective
JB1GU	JSLIST Block 1 Glove Upgrade
JB2GU	JSLIST Block 2 Glove Upgrade
JBAIDS	Joint Biological Agent Identification and Diagnostic System
JBPDS	Joint Biological Point Detection System
JBREWS	Joint Biological Remote Early Warning System
JBSDS	Joint Biological Stand-off Detection System
JBTDS	Joint Biological Tactical Detection System
JBUD	Joint Biological Universal Detector
JCAD	Joint Chemical Agent Detector
JCATS	Joint Conflict and Tactical System
JCBAWM	Joint Chemical Biological Agent Water Monitor
JCESM	Joint Chemical Environment Survivability Mask
JCPE	Joint Collective Protection Equipment
JCPI	Joint Chemical Protection Improvement
JCSD	Joint Contaminated Surface Detector

JDVD	Joint Decontamination Visualization Detector
JEM	Joint Effects Model
JFOC	Joint Future Operational Capability
JGEM	Joint Ground Effects Model
JMNS	Joint Mission Needs Statement
JMANS	Joint Multi-mission Advanced NBC System
JMSAD	Joint Miniature Stand-Off Agent Detector
JOEF	Joint Operational Effects Federation
JORD	Joint Operational Requirements Document
JP-5	Jet Propellant 5 (standard high flash point Navy fuel, MIL-T-5624)
JP-8	Jet Propellant 8 (standard AF kerosene jet fuel, MIL-T-83133)
JPACE	Joint Protective AirCrew Ensemble
JPL	Joint Priority List
JPO-BD	Joint Program Office for Biological Defense
JS	Joint Service
JSAM	Joint Service Aircrew Mask
JSCESS	Joint Service Chemical Environmental Survivability Suit
JSCRS	Joint Service Container Refill System
JSFXD	Joint Service Fixed Site Decontamination
JSGM	Joint Service Ground Mask
JSGPM	Joint Service General Purpose Mask
JSIG	Joint Service Integration Group
JSIMS	Joint Simulation System
JSLIST	Joint Service Lightweight Integrated Suit Technology
JSLNBCRS	Joint Service Lightweight NBC Reconnaissance System
JSLSCAD	Joint Service Lightweight Stand-Off Chemical Agent Detector
JSMCBD	Joint Service Multispectral Chemical Biological Detector
JSMG	Joint Service Materiel Group
JSMLT	Joint Service Mask Leakage Tester
JSMVS	Joint Service Mask Validation System
JSOR	Joint Service Operational Requirement
JORD	Joint Operational Requirements Document
JSSED	Joint Service Sensitive Equipment Decontamination
JSWAD	Joint Service Wide Area Detection
JSWILD	Joint Service Warning and Identification LIDAR Detector
JTCOPS	Joint Transportable Collective Protection System
JVAP	Joint Vaccine Acquisition Program
JWARN	Joint Warning and Reporting Network
JWARS	Joint Warfare System
km	Kilometer
LAV	Light Armored Vehicle
LANL	Los Alamos National Laboratory
LDS	Lightweight Decontamination System
LEO	Low Earth Orbit
LHA	General Purpose Amphibious Assault Ship
LHD	General Purpose Amphibious Assault Ship (with Internal Dock)

LIDAR	Laser Identification Detection and Ranging
LLNL	Lawrence Livermore National Laboratory
LNBCRS	Lightweight Nuclear, Biological, and Chemical Reconnaissance System
LPDS	Lightweight Portable Decontamination System
LRBSDS	Long-Range Biological Stand-off Detection System
LSCD	Laser Stand-off Chemical Detector
LSD	Landing Ship, Dock
MAMP	Mission Area Materiel Plan
MANAA	Medical Aerosolized Nerve Agent Antidote
MDS	Modular Decontamination System
MICAD	Multipurpose Integrated Chemical Agent Detector
MNS	Mission Need Statement
MOPP	Mission Oriented Protective Posture
M&S	Modeling and Simulation
MS	Milestone
MS	Mass Spectrometry
MSAD	Multiple Stand-off Agent Detector
MTW	Major Theater War
MULO	Multi-Purpose Overboot
NAAK	Nerve Agent Antidote Kit
NAPP	Nerve Agent Pyridostigmine Pretreatment
NARAC	National Atmospheric Release Advisory Capability
NBC	Nuclear, Biological, and Chemical
NBCCS	Nuclear, Biological, and Chemical Contamination Survivability
NBCRS	Nuclear, Biological, and Chemical Reconnaissance System
NBC UGVS	Nuclear, Biological, and Chemical Unmanned Ground Vehicle System
NCB-R	Nuclear, Chemical, Biological, and Radiological
NDI	Non-Developmental Item
NDPO	National Domestic Preparedness Office
NGA	Next Generation Anthrax Vaccine
NGAM	Next Generation Aviation Mask
NGGPM	Next Generation General Purpose Mask
NIH	National Institutes of Health
NIOSH	National Institute for Occupational Safety and Health
NIPG	Navy Individual Protective Gear
NIST	National Institute for Standards and Technology
O&M	Operation and Maintenance
OCONUS	Outside Continental United States
OIPT	Overarching Integrated Process Team
OOTW	Operations Other Than War
OGA	Other Government Agency
ONR	Office of Naval Research
OPTEMPO	Operational Tempo
ORD	Operational Requirements Document
OSD	Office of the Secretary of Defense
P3I	Pre-Planned, Product Improvement

PATS	Protection Assessment Test System
PCPS	Portable Collective Protection System
PDDA	Power Driven Decontamination Apparatus
PE	Program Element
PM	Program/Project/Product Manager
POD	Port of Debarkation
POM	Program Objective Memorandum
PROT CLTH	Protective Clothing (Joint Service Lightweight Integrated Suit Technology/Fire Fighter Ensemble/Explosive Ordnance Disposal)
QDR	Quadrennial Defense Review
R&D	Research and Development
RDA	Research, Development, and Acquisition
RDTE	Research, Development, Test and Evaluation (also RDT&E)
RES	Restoration
RestOps	Restoration of Operations
REW	Remote Early Warning
RFDBDS	Rapid Field Deployable Biodosimetry System
RLI	Residual Life Indicator
RNA	Ribonucleic Acid
ROC	Required Operational Capability
RSCAAL	Remote Sensing Chemical Agent Alarm
RSTA	Reconnaissance, Surveillance, and Target Acquisition
RW	Radiological Warfare
S&T	Science and Technology
SAFEGUARD	Scanning Airborne Emission for Gaseous Ultra-Spectral Analysis and Radiometric Detection
SALAD	Shipboard Automatic Liquid Agent Detector
SBA	Simulation Based Acquisition
SBCCOM	Soldier and Biological Chemical Command
SBIR	Small Business Innovative Research
SBTT	Small Business Technology Transfer
SCAMP	Shipboard Chemical Agent Monitor - Portable
SCPE	Simplified Collective Protection Equipment
SDS	Superior Decontamination System
SEARCH	Stand-off detection Early warning Agents of biological origin, Radiological Chemical system
SEB	Staphylococcal Enterotoxin Type B
SERPACWA	Skin Exposure Reduction Paste Against Chemical Warfare Agents
SL	Sensor Link
SNL	Sandia National Laboratory
SOF	Special Operations Forces
SOMCBD	Special Operations Modular Chemical/Biological Detector
SON	Statement of Need
SORBDECON	Sorbent Decontamination System
SORD	Soldier Oriented Research and Development
SPOD	Sea Ports of Debarkation

SRBSDS	Short Range – Biological Stand-off Detection System
STAFFS	Simulated Training and Analysis for Fixed Facilities/Sites
STB	Super Tropical Bleach
STEPO	Self-Contained, Toxic Environment, Protective Outfit
TAP	Toxicological Agent Protective
TARA	Technology Area Review and Assessment
TBD	To Be Determined
TBMD	Technology Base Medical
TBNM	Technology Base Non-Medical
TEMPER	Tent Extendable Modular Personnel
TIC	Toxic Industrial Chemical
TIM	Toxic Industrial Material
TOC	Total Ownership Costs
TOF	Time Of Flight
TPDP	Transdermal Prophylactic Delivery Patch
TSP	Topical Skin Protectant
TT Bio	Technology Transfer For Biological Sensors
UAV	Unmanned Aerial Vehicle
UN	United Nations
UNSCOM	United Nations Special Commission
U.S.	United States
USANCA	U.S. Army Nuclear and Chemical Agency
USUHS	Uniformed Services University of Health Sciences
UV-LIF	Ultraviolet Laser Induced Fluorescence
VALRA	Vapor, Aerosol, Liquid Recorder/Alarm
VLSTRACK	Vapor, Liquid and Solid Tracking
VPS	Virtual Prototyping Suite
VV&A	Validation, Verification, and Accreditation
VEE	Venezuelan Equine Encephalitis
WEE	Western Equine Encephalitis
WideSpec	Wide Spectrum
WMD	Weapons of Mass Destruction

Executive Summary

As the Department of Defense (DoD) prepares for the global challenges of the 21st Century, the continuing proliferation of weapons of mass destruction, terrorism, and the nexus between them remains the greatest direct threat to U.S. military forces worldwide. Development of effective capabilities to counter the threat is vital to ensuring full dimensional protection of U.S. Forces in a contaminated environment. Our investments therefore must be selective, focusing on the threats and opportunities most relevant to our requirements and applying our resources where we can make the greatest difference. The Joint Service Materiel Group (JSMG) has developed a coordinated Research, Development, and Acquisition (RDA) plan that supports the seamless integration of technologies into a system-of-systems architecture for integration across the spectrum of combat and support systems. This plan reveals the Joint Services' strategy for reducing Chemical and Biological (CB) defensive capability shortfalls in the mid-term while modernizing to meet far-term Joint Future Operational Capabilities (JFOCs).

This plan illustrates a comprehensive business strategy of how the Military Departments will build the CB Defense Program (CBDP) to meet Commander-In-Chief (CINC) and warfighter requirements and provides an overall assessment on the fiscal and technological outlook for the period FY03-17. The CB Defense programs are categorized broadly under six operationally oriented commodity areas: contamination avoidance, individual protection, collective protection, decontamination, medical systems, and modeling and simulation. All commodity areas are interrelated and critical to the defense of our forces and support *Joint Vision 2020*. U.S. Forces must be able to avoid contamination when possible, reduce the level of mission-oriented protective posture quickly, decontaminate personnel and equipment when necessary, and restore operational capability effectively.

The Military Departments, through participation in the Joint Service CB Defense Program, prepare this plan. The *Introduction* section outlines the program's purpose and is followed by a *Threat Assessment* section. The *Capstone Acquisition Strategy* section gives a macro level view of the program. Details for each commodity area, along with operational impacts, are in the *CB Defense Commodity Areas* section. The *Overall Assessment* section gives a fiscal and technological outlook of the program for the near-, mid-, and far-terms.

In the near-term (today through FY02), combat forces have critical biological, chemical, and radiological defensive capability shortfalls that can be partially corrected during the mid-term (FY03 to FY07). The outlook for the far-term (FY08 to FY17) can be optimistic if the plan is implemented and adequately resourced. Technological superiority has been, and continues to be, a cornerstone of our national military strategy. Continuous incremental investment is the key to maintaining a technological edge and implementing a successful RDA strategy. This strategy allows us to decisively prevail across the broad spectrum of conflict with minimal casualties. To achieve the U.S. vision of full spectrum dominance and to balance capabilities in a potentially contaminated battlespace, the CBDP focuses on two operationally oriented and CINC-driven imperatives: maintaining operational tempo (OPTEMPO) and protecting the force.

The RDA plan outlines the Services' focus on developing improved capabilities in areas of CB defense to reduce capability shortfalls and deficiencies. Specifically, deficiencies exist in

the areas of contamination avoidance, decontamination, individual and collective protection, medical countermeasures, and modeling and simulation. Within contamination avoidance, the Services are procuring chemical stand-off and biological point detection systems which will be networked to provide an early warning detection capability for Command and Control. In the far-term, advancements in technology base are expected to improve capabilities in all areas, especially within the decontamination and collective protection commodity areas.

The basic concept of operations in a CB contaminated environment is early detection and warning to provide situational awareness and permit forces to avoid the threat. Ultimately the goal of contamination avoidance is to provide the CINCs and warfighter a real-time capability to detect, identify, map, quantify, and warn against all Nuclear, Biological, and Chemical (NBC) agents and Toxic Industrial Materials (TIMs) below the incapacitating or infectious threshold value. This includes developing and fielding long-range biological and chemical detection stand-off and early warning networked systems. Current technology investments focus on increased detection sensitivity, specificity across the evolving spectrum of threat agents, signature, false alarm rate reduction, and integration of biological, chemical, and radiological detectors into mapping and communications networks. In the future, we plan to field a "sensor-to-warrior" communication package that will enhance real-time information flow for commanders across the battlespace. Mid-term and far-term technologies will integrate chemical and biological point and stand-off detectors into a single system.

When avoidance is not possible, individual protection programs (protective masks and protective clothing) will allow forces to maintain operational effectiveness in a contaminated environment with minimal impact on logistics. Individual protection focuses on development and acquisition of lighter, less burdensome protective garments that protect the warfighter against combined environmental effects without degrading mission performance. Our program goal is to address the warrior as a system and integrate chemical and biological protection into a total combat ensemble. Service requirements will define future technology efforts to develop new composite fabrics and filtration materials. Additionally, the Services are pursuing common interim mask performance specifications to serve as a baseline for fielding protective masks for both ground and air warriors in the mid-term.

Collective protection is required to minimize mission degradation and sustain operations by providing a contamination-free environment where gas masks and protective clothing are not required. Collective protection can be integrated into various platforms, including tents, shelters, buildings, ships, vehicles, and aircraft. The near- and mid-term goals of the collective protection commodity area are to provide effective and cost efficient protection to an increased number of critical platforms in command/control, medical, and rest/relief areas. The program strategy focuses on fielding an increased number of platforms while using new technologies to make incremental improvements to currently fielded equipment. Improvements are needed in the areas of system cost, weight, package volume, transportability, operation and maintenance, and logistics. The long-term goal is to make collective protection transparent to the warfighter by providing integrated collective protection to all Service platforms.

Decontamination capabilities are required to sustain operations in a CB-contaminated environment; to ensure power projection capabilities, particularly for ports and airfields of

debarkations; to clean up areas for resupply operations; and to reconstitute individual equipment, vehicles, sensitive equipment, and weapon platforms. The overall goal for this area is to provide technology for the safe removal, neutralization, and elimination of chemical and biological threat agents from personnel and equipment, while eliminating or reducing the impacts on performance, logistics, and the environment. The CBDP strategy is to field a limited number of modular decontamination systems in the near-term to replace legacy systems. The Services will procure non-developmental items to provide an interim capability to decontaminate Aerial Ports of Debarkation (APOD) and Sea Ports of Debarkation (SPOD). Mid-term goals will focus on developing fixed site decontamination capabilities to reduce the impact of NBC warfare on theater ports and airfields, including Command and Control (C2), staging, and logistics facilities. Far-term goals include developing a replacement for the current set of caustic decontaminants, a non-aqueous based decontamination system, and a sensitive equipment decontamination system.

Medical chemical and biological defense programs address a variety of requirements with an emphasis on preventive medicine related to chemical and biological warfare threats. Safe, effective vaccines and pretreatment (prophylactic) drugs will provide personnel with long lasting immunity to or protection against, the effects from the exposure to threat agents. In addition, they will give personnel resistance to both the early and long-term effects of ionizing battlespace radiation. This prevents casualties and minimizes performance degradations by allowing troops to operate in a greater range of threat environments with less burdensome individual protective equipment. Definitive medical diagnostics will rapidly identify biological, chemical, and radiological exposures and provide information to augment medical and command decision-making. Developing drugs, immunotherapies, or other therapeutics will provide treatments for personnel after exposure to threat agents.

The Modeling and Simulation commodity area provides tools to aid in the assessment of Joint Service doctrine, to "train the way we fight," to make materiel development decisions prior to incurring acquisition or significant test and evaluation costs, and to assess equipment design parameters and trade-offs. In addition, these specific models and simulations provide the warfighter with the capability to track and maintain battlespace situational awareness, to predict hazards and provide accurate warning, and to plan and modify operations in near-real-time.

In addition to the six operationally oriented commodity areas, the CBDP has been directed to integrate the Consequence Management (CoM) mission area to enable centralized planning and execution. The Consequence Management mission area includes equipment research, development, and acquisition for the Department of Defense's role in supporting the lead Federal agency in responding to the consequences of a domestic incident involving chemical, biological, radiological, or nuclear material. The mission area will be responsive to the guidance of the Office of the Secretary of Defense, the needs of the operational community, and will utilize best business practices to provide materiel support.

Assessments of each of the commodity areas have identified contamination avoidance, individual protection, and medical defense areas as being stable, and the collective protection, decontamination, and modeling and simulation areas as less robust (see Table 1). The overall DoD CBDP is assessed as AMBER (reduced capability to fully meet all CINC requirements) and is expected to remain there for the mid-term. Modernization efforts across the commodity areas

will significantly improve capabilities in some areas, although the increased CINC requirements to defend against "asymmetric" threats will likely add to materiel shortages.

Commodity Area	Near-Term		Mid-Term		Far-Term	
	Fiscal	Tech	Fiscal	Tech	Fiscal	Tech
Contamination Avoidance	Amber	Amber	Amber	Amber	Green	Green
Individual Protection	Amber	Amber	Amber	Amber	Green	Green
Collective Protection	Red	Amber	Amber	Amber	Amber	Amber
Decontamination	Amber	Red	Green	Amber	Green	Green
Medical Systems	Amber	Amber	Amber	Amber	Amber	Green
Modeling and Simulation	Red	Amber	Red	Amber	Red	Amber
OVERALL	Amber	Amber	Amber	Amber	Amber	Green

Green, Fiscally Constrained - Adequate funding/industrial base to fully meet requirements in 2 MTWs through fielded systems.
Green, Technology Constrained - Adequate technology base to support commodity area modernization objectives.

Amber, Fiscally Constrained - Reduced funding/industrial base to fully meet requirements in 2 MTWs through fielded systems.
Amber, Technology Constrained - Reduced technology base to support commodity area modernization objectives.

Red, Fiscally Constrained - Inadequate funding/industrial base to meet requirements in 2 MTWs through fielded systems.
Red, Technology Constrained - Inadequate technology base to support commodity area modernization objectives.

Table 1. Commodity Area Status

The CBDP is based on a system-of-systems architecture that must work in synchronization to provide a seamless defensive capability that aids commanders in avoiding contamination, managing battlespace information, protecting the force, and quickly restoring operations. This RDA plan outlines improvements to satisfy CINC requirements; however, adequate resources must be provided to bring to bear all the capabilities needed to achieve our objectives. Failure to maintain a robust CB defense capability may result in unnecessary risk to U.S. Forces. Moreover, the CB defense community is actively coordinating with the Department of Energy (DOE) and the Defense Advanced Research Projects Agency (DARPA) to ensure programs are integrated to leverage the best capabilities for the warfighters. Many of our objectives are best achieved – or can only be achieved – by leveraging opportunities created through coordination. The FY03 program and beyond is balanced, coordinated, integrated, and the Joint community is committed to being the clear, unequivocal world leader in CB defense.

Section A: Introduction

1.0 Purpose of the Plan

The objective of this Joint Service Chemical and Biological (CB) Defense Research, Development, and Acquisition (RDA) Plan is to explain the investment strategy in technologies that will enable our forces to survive, fight, and win in CB-contaminated environments. This plan describes all current and planned Joint Service CB Defense RDA programs for the period FY03-17. It provides program goals, descriptions, schedules, funding profiles, and critical issues. The RDA Plan also depicts overarching processes for achieving materiel modernization to improve U.S. CB defense readiness in accordance with Commander-In-Chief (CINC) warfighter requirements. This plan emphasizes an investment philosophy that provides complementary early warning, improved medical and non-medical protection, and improved restoration capability, with minimal adverse impact on the warfighting capability.

2.0 Background and Overview

In January 1995, the Department of Defense (DoD) implemented Public Law 103-160 by establishing the Joint Service Materiel Group (JSMG) and the Joint Service Integration Group (JSIG) to develop and promote Joint Service coordination and integration across the CB defense mission area.

The current Joint CBDP provides protection against both traditional and asymmetric NBC threats, but shortfalls do exist. These include an inability to detect a number of chemical and biological threat agents and to quickly warn area commanders of the dangers. Another concern is insufficient quantities of modernized CB defense equipment to fully equip the forces necessary for two nearly simultaneous Major Theater Wars (MTWs). This RDA plan identifies biological, chemical, and radiological equipment procurement quantities, while the Joint Service NBC Defense Logistics Support Plan identifies and discusses sustainment issues.

Joint CB Defense Concept

- Avoid Contamination
- Manage the Battlespace
- Protect the Force
- Restore Operations

This RDA plan is based on the coordinated Joint NBC Defense Concept (Sep 97), the Joint Service Modernization Plan (May 00), and the FY01 NBC Defense JFOCs (Nov 00). The Joint NBC Defense Concept emphasizes a vision of four interrelated focus areas: (1) Contamination Avoidance, (2) NBC Defense Battlespace Management, (3) Protection, and (4) Restoration Operations. Together, these focus areas provide a means of categorizing the capabilities needed to accomplish all phases of a Joint NBC Defense operation, as outlined in Joint Pub 3-11, "Joint Doctrine for Nuclear, Biological, and Chemical (NBC) Defense." The RDA Plan is organized in accordance with this concept.

The Joint Service Modernization Plan focuses on joint concepts and joint integrated systems to provide the most effective CB defense capability for U.S. Forces through the far-term. Included as an annex in the Modernization Plan are the JFOCs. The purpose of the JFOCs is to identify and prioritize Joint user (CINC and Services) far-term future operational capabilities as

expressed in the Joint NBC Defense Concept. The overall intent is to provide enhanced user guidance to the Joint NBC Defense Science and Technology (S&T) community and to establish an understandable link between near- and far-term Joint CB defense research and development efforts and user needs.

The DoD's Program Strategy Guidance used in developing the consolidated CB Defense Program Objectives Memorandum (POM) stresses Defense Planning Guidance goals, key mid-term objectives, other special program items of interest focusing on total force protection for all warfighters, and maintaining maximum operational tempo (OPTEMPO) in all contaminated environments. This RDA plan assigns highest priority to those high priority JFOCs that currently fall short of expected capability levels. Specifically, contamination avoidance systems or capabilities, which support aspects of all four components of the Joint NBC Defense Concept. Furthermore, the plan defines a baseline for reflecting the FY02 President's Budget (PB) by examining program efforts against the ability of the industrial and technology bases to support execution. The Joint Priority List (JPL) and a list of Lead Services and associated Operational Requirements Documents (ORDs) are provided in Appendices A and B, respectively.

The plan is organized in six sections: *Introduction, Threat Assessment, Capstone Acquisition Strategy, CB Defense Commodity Areas, Overall Assessment,* and *Appendices*. The *Threat Assessment* section summarizes the proliferation of CB weapons in a succinct, unclassified manner. The *Capstone Acquisition Strategy* section shows the approach necessary to achieve our CB defense concept at a macro level. This includes the plan for transitioning science and technology initiatives to development, production, and fielding, and for integrating the variety of CB defense equipment into a total CB defense architecture. The *CB Defense Commodity Areas* section provides specific details for systems organized by commodity area, showing our mid-term and far-term goals. This section provides program assessments and discusses the operational impacts associated with each commodity area. Each commodity area has "roadmap" displays of the necessary downselects and outselects, and examines the synergy that exists between similar technologies in respective sub-areas. The *Overall Assessment* section discusses the interrelationships of the commodity areas that form the CB defense "system of systems" architecture and presents an overall fiscal and technological assessment of the program. The six commodity areas are discussed below.

Six Commodity Areas

- Contamination Avoidance
- Individual Protection
- Collective Protection
- Decontamination
- Medical Systems
- Modeling and Simulation

2.1 Contamination Avoidance

Heightened OPTEMPO requirements and the challenge of increased agent diversity demand responsive biological, chemical, and radiological reconnaissance, agent detection, identification, warning, and reporting. The contamination avoidance commodity area faces a number of technical and management challenges. The JSMG has addressed these challenges by consolidating separate chemical detection programs into coordinated Joint programs. In addition, the CBDP is responsible for the coordination of Joint Service biological agent point and early warning detection programs. In the far-term, the CBDP is focusing on technologies that

will unite chemical and biological point and stand-off detectors into a single system. To address the need for rapid communication of NBC threats throughout the battlespace, an aggressive and innovative program is being established to provide automated and digitized warning and reporting.

2.2 Individual Protection

Forces cannot always avoid biological, chemical, and radiological hazards; therefore, they need individual protective equipment for life sustainment and continued operational capability. To prepare for this, the CBDP plans to field protective masks that provide greater user comfort, reduced respiratory stress, and improved compatibility with combat weapon systems. Technology advances are being pursued to produce mask systems that provide fully compatible vision capabilities, laser/ballistic protection, and further reduction in logistics and physiological burden. Additionally, protective clothing and integrated suit ensembles are being developed that will improve protection, reduce the physiological burden, have extended durability, and have less weight and heat stress burden than present equipment.

2.3 Collective Protection

Collective protection consists of NBC protective filters and air movement devices that provide filtered and pressurized air to a wide range of applications, including mobile and fixed command posts, medical facilities, rest and relief shelters, buildings, vehicles, aircraft, and ships. Lightweight shelters fabricated of CB resistant materials and integrated with NBC filtration, environmental control and power generation facilities for medical treatment facilities have been developed and are in production. Major weapon systems, such as the Army's Comanche helicopter and the Marine Corps' V-22 Osprey, include integrated collective protection systems in their program development. New production ships and designated combat vehicles are fitted with collective protection systems during construction, and critical spaces on amphibious ships will be retrofitted to ensure that our crews can continue critical combat missions in contaminated environments. Technology improvements are being pursued to improve filtration capacity against current and future NBC agents and to reduce weight, volume, cost and improve the deployability of shelters and filtration systems.

2.4 Decontamination

Decontamination systems enable commanders to return contaminated units, including logistics support, to full combat OPTEMPO. The CBDP emphasis is to make decontamination systems less labor and logistics intensive, particularly in terms of water and bulk decontaminant supplies. Future decontaminants must be less harmful to the environment, the warfighter, and all military equipment. A family of decontaminants may be necessary to meet all requirements. To support the U.S. global reach policy, equipment and procedures are needed for decontaminating mission critical areas within large area ports, airfields, and other fixed sites, which may be targeted for persistent agent contamination. Technological advances in sorbents, coatings, catalysts, and physical removal will reduce logistics burdens, manpower requirements, and lost operational capability associated with decontamination operations.

2.5 Medical Systems

Medical CB and medical radiological defense research efforts focus on developing safe and effective vaccines and prophylactics to provide personnel with long lasting immunity to, or protection against, CB agents and resistance to both the early and long-term effects of ionizing radiation. Work in these areas is also underway to perfect rapid and definitive medical diagnostics, and to develop drugs and other therapeutics for effective post-exposure treatment of CB casualties. Medical CB defense is committed to maintaining technological capability to meet present requirements and to counter future threats by providing individual-level prevention and protection to preserve warfighting strength.

2.6 Modeling and Simulation

The Modeling and Simulation (M&S) commodity area efforts are focused to meet the emerging requirements for training, operations, analysis, and acquisition modeling and simulation to meet the long term Joint Future Operational Capabilities (JFOCs). Simulation Based Acquisition efforts support the other commodity areas which build upon existing tools and data bases to create a Virtual Prototyping Suite in addition to developing a wide range of stand-alone and integrated M&S tools. The Joint Warning and Reporting Network (JWARN) Information System, to include required analytical M&S, will continue to be developed for direct use by the Contamination Avoidance (CA) commodity area. Material development efforts are planned to meet the full spectrum of users needs, from ballistic missile intercept to toxic industrial chemical accidents. These efforts will produce battle management and battle awareness systems to allow battlefield commanders to make timely accurate decisions and to better visualize the battlespace.

2.7 Consequence Management

The CBDP has been directed to integrate the Consequence Management (CoM) mission area to enable centralized planning and execution. The Consequence Management mission area includes equipment research, development, and acquisition for the Department of Defense's role in supporting the lead Federal agency in responding to the consequences of a domestic incident involving chemical, biological, radiological, or nuclear material. The mission area will be responsive to the guidance of the Office of the Secretary of Defense and the needs of the operational community and utilize best business practices to provide materiel support. A Front-End Analysis (FEA) to be completed in FY01 will establish materiel goals for the CoM mission area.

3.0 Perspective

The DoD CBDP is a true Joint Service partnership that consolidates Joint Service requirements into a single DoD-wide budget line to reduce overall costs. The Joint Service CB Defense RDA Plan provides a blueprint for developing, procuring, and fielding CB defense systems, and for understanding the operational impacts on our future warfighters. The plan describes CB defense RDA as a coordinated Joint Service effort and provides a process to acquire a system of integrated equipment necessary to protect the force.

This RDA Plan focuses on modernization efforts that will provide a balanced CB defense capability across the Joint force. The Joint Services are developing and fielding Joint Service CB defense equipment that will enable U.S. Forces to deploy and fight in an NBC threat environment with maximum OPTEMPO and minimal casualties. This is accomplished by leveraging information-based technologies, emphasizing full-spectrum protection capabilities that minimize performance degradation, accelerating programs that support the CINC's battle plans, and addressing unique Special Operations Forces (SOF) requirements.

Section B: Threat Assessment

1.0 Introduction

An entire decade has passed since the cease-fire order ended Operation Desert Storm. In the years since, many significant steps have been taken to enhance the chemical, biological, and nuclear defense readiness of U.S. forces, including the establishment of the Joint Service CBDP. However, in the past ten years there have also been many developments throughout the world that complicate our NBC defense posture.

> *Several rogue states will likely acquire nuclear weapons during the next decade or so, and some existing nuclear states will undoubtedly increase their inventories. Chemical and biological weapons are generally easier to develop, hide, and deploy than nuclear weapons and will be readily available to those with the will and resources to attain them.*
>
> **Vice Admiral Thomas R. Wilson**
> **Director, Defense Intelligence Agency**
> **Statement for the Record, Senate Select Committee on Intelligence**
> **2 February 2000**

We are increasingly aware that government-sponsored nuclear, biological, and chemical warfare programs cover the globe. The list of countries involved in chemical and biological warfare programs has grown. More countries are stockpiling nuclear weapons. Terrorists have conducted chemical and biological attacks, and there are recent reports about the "emerging threat" in which newly engineered and altered forms of biological agents, or totally new chemical agents could be developed to challenge the effectiveness of current protective equipment or medical countermeasures.

Many of the countries engaged in offensive NBC programs are involved in more than one form, and most combine their efforts in NBC with long-range ballistic missile acquisition efforts. There is also a sense that asymmetric threats, including terrorist use of chemical, biological, and radiological material will become increasingly more likely.

2.0 Nuclear Threat

The proliferation of nuclear weapons and technology is expected to continue. The surprise Indian and Pakistani nuclear testing in 1998, followed by their long-range ballistic missile tests in 1999, demonstrated the reality of the proliferation threat, and that inspections and intelligence might not always predict technical advances toward nuclear weapons development. The nuclear programs on the Indian sub-continent are examples of the kind of progress that can be made in nuclear weapons development, even in the face of international safeguards and the threat of economic sanctions. The fact that both countries seem locked in a state of semi-crisis and that their leaders have "rattled the nuclear saber" only adds to the concern.

China and Russia both have significant tactical and strategic nuclear arsenals undergoing modernization. Although the Russian nuclear stockpile is being reduced, there are concerns regarding the security of the remaining stockpile. The Chinese conducted ballistic missile tests in 1999, they are adding to their land-based missile force, are developing a new strategic missile submarine, and, according to news reports, are building two short-range ballistic missile bases near Taiwan.

In addition, North Korea is known to have produced enough plutonium to make at least one nuclear device. The inspection regime meant to contain the North Korean nuclear program has been challenged, and its long-term effectiveness has yet to be determined. The North Korean ballistic missile program has received significant attention in the past few years. Even if their work on intermediate range ballistic missiles slows, North Korea's short range ballistic missile program remains a real concern for U.S. Forces in Northeast Asia.

Similarly, Iran continues to expand the technical and industrial infrastructure necessary to achieve a level of self-sufficiency and expertise in nuclear-related technologies. Iran declares this increased technical capability is peaceful in nature, but the expertise and the facilities could also support nuclear weapons development.

3.0 Biological Threat

The Defense Intelligence Agency estimates that more than ten countries have active biological warfare (BW) programs. Some have achieved weaponization, and others will attain that status very soon. The stunning 1995 revelations of the broad Iraqi BW program show how a small core of dedicated specialists can bring a multi-agent program from research to weaponization in less than five years. A number of other countries have the infrastructure, technical expertise, and degree of secrecy needed to emulate the Iraqi program.

Concerns relating to potential military use of biological warfare agents focus primarily on Russia, because of its heritage of an extensive Soviet-era BW program. Iraq is regarded as a threat because of the extent of its program in the late 1980s and early 1990s, and the fact that the United Nations (UN) is no longer inspecting the country. China is a concern because of strong evidence that its offensive BW program is being maintained. Syria and Iran have also been identified as having offensive BW programs. The North Koreans are suspected of having an active BW program because of their long history of research and development in the technologies associated with agents.

More generally, there are concerns that medical and pharmaceutical facilities can be exploited for the purpose of BW. Technologies meant to enhance the efficacy of medicines can also be used to produce infectious pathogens. Evidence exists that scientists involved in various foreign BW programs have incorporated advances in biotechnology and genetic engineering into their search for improved biological warfare agents.

As deadly as they now are, BW agents could become even more sophisticated. Rapid advances in biotechnology present the prospect of a new array of toxins or live agents that require new detection methods, preventative measures, and treatments.

Statement by Director of Central Intelligence
George J. Tenet
Senate Foreign Relations Committee
21 March 2000

4.0 Chemical Threat

Over 20 nations are assessed to have initiated chemical warfare (CW) programs. While a small number are believed to have abandoned their active programs, the majority remains committed to CW agent production and the weaponization of a variety of agents in both short and long-range weapons. New countries have been added to the CW list in recent years.

Russia may have retained most of the chemical weapons of the Soviet Union. Recent allegations from Russian "whistleblowers" have warned of undeclared CW agents and weapons in Russia. There are specific concerns with so called "Fourth Generation Agents" developed more recently than V-series agents. Intelligence community leaders have testified about the possible transfer of chemical agent expertise, precursors, and technology from Russia to other countries. There is, certainly, latent expertise in CW agent development in Russia, and it probably exists in a number of the other former Soviet republics.

Many countries are thought to have well-hidden CW programs. The revelations of the Iraqi CW program provide a real-world example of how quickly a robust CW program can be achieved through a combination of secrecy and state sponsorship. Concerns for our deployed forces continue due to the assessed Chemical Warfare Agent (CWA) threat from North Korea, Iran, Syria, and Libya. There are indications that various Middle Eastern and Asian nations remain on the path to CWA weaponization, even after they have signed and ratified the Chemical Weapons Conventions.

Tehran's goals for its CW program for the past decade have been to expand its production capability and stockpile, reach self-sufficiency by acquiring the means to manufacture chemical production equipment and precursors, and diversify its CW arsenal by producing more sophisticated and lethal agents and munitions.

Statement by John A. Lauder
Director, DCI Nonproliferation Center
Senate Committee on Foreign Relations
5 October 2000

5.0 Insurgent, Terrorist, or Industrial Hazardous Material Threat

Transnational groups include terrorists, fanatical cultists, insurgent forces in nation states, opposing factions in civil wars, and members of organized criminal groups. Such groups do not

operate within the constraints imposed on recognized nations. Consequently, if they acquire chemical, biological, radiological, or nuclear capabilities, they can pose a significant "asymmetrical" threat to our interests at home or abroad.

This threat has been most starkly demonstrated by the nerve agent attacks in Japan. The ability of terrorists to take the initiative in their choice of targets and the timing of attacks significantly complicates our ability to combat the threat.

> *I expect these (NBC) weapons to be widely proliferated, and they could well be used in a regional conflict over the next 15 years. I am also concerned that sub-national groups or individuals will use chemical or biological agents in a terrorist or insurgent operation. Such an event could occur in the United States or against U.S.-allied forces and facilities overseas.*
>
> **Vice Admiral Thomas R. Wilson**
> **Director, Defense Intelligence Agency**
> **Statement for the Record, Senate Select Committee on Intelligence**
> **2 February 2000**

While the majority of such groups are unlikely to have the financial and technical resources necessary to acquire nuclear weapons, reports of criminal groups smuggling nuclear materials remain a concern. We have also witnessed an increase in the number of incidents involving alleged anthrax use. While all cases to date have proven to be false, the likelihood for use of BW agents in a terrorist act remains real.

Intelligence community spokesmen have provided evidence that some terrorist groups are seeking to achieve NBC capabilities, and that they have considered chemical, biological, radiological, or nuclear use. There is little doubt that many groups are capable of producing chemical or biological agents.

In addition, there is a growing concern that the wide availability of many toxic industrial materials (TIMs) makes them potential tools for asymmetric attacks against U.S. Forces, both within the United States and abroad.

6.0 Summary

The full extent of the Iraqi NBC program profoundly affected our perceptions of proliferation. Events since 1991 make clear that as important as treaties and international trade restrictions are, they can not be relied upon to eliminate the proliferation of NBC technologies, materials, and expertise. And recent events, such as the attack on the USS Cole, remind us that our military forces are, indeed, at risk from asymmetric attacks.

The proliferation of nuclear, biological, and chemical weapons and the potential for NBC terrorism remain direct threats to U.S. Forces worldwide and justify continued research, development, and acquisition of improved NBC defense materiel.

Section C: Capstone Acquisition Strategy

1.0 Introduction

The Capstone Acquisition Strategy provides a macro view of the DoD CB defense research, development and acquisition program. The JFOCs and the Joint Service Modernization Plan serve as the foundation for improving the Joint Service CB defense materiel readiness posture. This section illustrates which operational capabilities will be fielded and how these operational capabilities form an architecture that addresses CINC requirements. The section further describes the overarching R&D effort and the links between commodity area planning and modernization. Appendix C contains a list of the most recently approved (1 November 2000) prioritized NBC Defense JFOCs to include the Functional Capabilities, Major JFOCs, and Minor JFOCs.

NBC Defense JFOCs Functional Capabilities

- Battle Management
- Contamination Avoidance
- Individual Protection
- Restoration Capability
- Collective Protection

2.0 Vision

Continued proliferation of weapons of mass destruction (WMD) creates the need to ensure that U.S. Forces can fight and win in environments contaminated by residual biological, chemical, and radiological material. Unpredictable adversaries and the ever-increasing availability of weapons information challenge U.S. researchers and developers to consider opportunities that will avoid surprise and achieve adequate defense by applying superior technologies. Evolving operational requirements will continue to drive the Joint RDA community to aggressively capture and leverage technological advances to provide the world's best CB defense equipment to the force, and do so within the tenets of CB defense doctrine, policy, and directives.

The CBDP is threat-driven and supports warfighters across the spectrum of potential conflicts. The program impacts all Joint warfighting capabilities by providing survivability that is seamlessly integrated into other battlespace systems. While CB agent detection remains one of our program's strong points, significant challenges remain in protection and restoration efforts.

The JSMG has a vision to develop state-of-the-art equipment and materiel that meets the intent of DoD's Program Strategy Guidance, resolves warfighter deficiencies, and ensures CB defense readiness. This plan supports the following development and procurement of biological, chemical, and radiological defensive equipment that permits the warfighters to:

- *View NBC Warfare Agents within the Theater Area of Operations –* ***(Early Warning and Stand-off Detection of NBC Agents)***.

- *Dominate the Battlespace through Reconnaissance, Surveillance, and Target Acquisition (RSTA) –* ***(NBC Reconnaissance Systems)***.

- *Enhance the Situational Awareness of Unit Battlespace –* ***(Expanded Sensor Capability for both Automatic Point and Remote Detection of NBC Agents)***.

- *Provide Real-Time Hazard Information to Influence Current Operations –* ***(NBC Battlespace Management, Warning & Reporting, and Modeling and Simulation)***.

- *Enhance Personnel and Equipment Survivability –* ***(Individual Detection, Individual and Collective Protection, Medical Defenses, Decontamination, and NBCCS)***.

- *Maintain Ground, Air and Maritime Operational Tempo –* ***(Operational Decontamination and Mobile Collective Protection)***.

- *Sustain Operations, Recovery and Reconstitution Efforts –* ***(Thorough Decontamination, Fixed Site Collective Protection, Medical Diagnosis and Treatment, Training and Readiness)***.

In order to attain our objectives, we must:

- *Continue to develop and manage the CBDP as a Joint effort.* ***Sharpen focus and discipline.***

- *Develop a true information-based contamination avoidance capability through a* ***real-time, automated*** *"sensor-to-warrior"* ***warning*** *system.*

- *Increase focus to maintain OPTEMPO under NBC threat conditions in addition to force protection.* ***Improve balance.***

- *Align the commodity areas with the Joint Vision and NBC Defense JFOCs,* ***battle management, contamination avoidance, individual protection, restoration capability, and collective protection***.

The Joint NBC Defense Concept identifies four focus areas (contamination avoidance, battlespace management, protection, and restoration operations) that translate to specific CINC requirements that the CBDP is committed to supporting. Appendix A contains the current Joint Priority List (JPL) of CB defense requirements. Each commodity area supports multiple CINC requirements. Meeting each CINC requirement depends on a combination of contamination avoidance, protection (medical and non-medical), modeling and simulation, and decontamination equipment. This is the "system of systems" concept that will achieve horizontal integration across the spectrum of combat and support systems. The following section details the requirements associated with achieving the Joint NBC Defense Concept and the JFOCs.

Contamination Avoidance requirements include:

- <u>View the theater area of operations</u>. Provide early warning of NBC agents through an integrated detection/communication system.

- Eliminate/minimize false alarms. Use "smart" sensors and automated assessment methods to synthesize data and send warnings only to affected units.

- Dominate the Battlespace through Reconnaissance, Surveillance, and Target Acquisition (RSTA).

CB Defense Capabilities That Support Contamination Avoidance

- Stand-off/Early Warning Detection
- NBC Reconnaissance
- Point Detection
- Automated Warning and Hazard Prediction

CB defense Battlespace Management requirements include:

- Provide real-time information to influence current operations. Communicate the hazards horizontally to affected units of all Services, and vertically to higher headquarters, through networked agent detectors and other related sensors.

- Recon Battlespace for potential NBC contamination hazards in a deployable and survivable military vehicle.

- Maintain surveillance of potential BW agent presence at fixed sites within the theater of operations.

Protection requirements include:

- Enhance personnel and equipment survivability. Provide high levels of protection for individuals and crews, while maintaining force effectiveness, combat lethality, and OPTEMPO. Include civil air and ship crews and ports of debarkation and embarkation work forces. Develop medical protection in the form of vaccines, pretreatments, skin protectants, and other means to increase individual resistance to biological, chemical, and radiological agent effects.

CB Defense Capabilities That Support Protection

- Reduced Degradation and Increased Personal Protection
- Increased Compatibility
- Expanded Use of Integrated Collective Protection
- Medical Vaccines and Pre-Treatments

- Maintain ground, air, and maritime OPTEMPO. Provide forces with the ability to stay in the battle through collective protection systems in vehicles, ships, and aircraft and through decentralized decontamination. Maintain sortie rates and port operations through rapid, fixed site decontamination systems.

- Minimize adverse effects to personnel with medical improvements.

Restoration requirements include:

- Sustain operations, recovery, and reconstitution efforts. Provide CINCs with the ability to bring the force back to full operational effectiveness quickly. Includes the ability to rapidly diagnose and treat NBC casualties; monitor for contamination; provide continuous collective protection in rear areas such as medical sites, depots, and repair facilities; and restore civil facilities and transportation necessary for force projection and maintenance of an overseas presence. Minimize both the time period for which forces are required to wear protective clothing and the workload required for assessing and decontaminating equipment and facilities.

CB Defense Capabilities That Support Restoration Operations

- Hazard Monitoring
- Hazard Decontamination
- Expanded Use of Collective Protection
- Rapid Medical Diagnostics
- Medical Post-Treatments

- Reduce the logistics burden of decontamination operations.

3.0 CB Defense Architecture

Joint Vision 2020 builds upon and extends the conceptual template established by *Joint Vision 2010* to guide the continuing transformation of America's Armed Forces. The overarching focus of *Joint Vision 2020* is **full spectrum dominance** – achieved through the interdependent application of **dominant maneuver, precision engagement, full dimensional protection, and focused logistics**. Attaining full spectrum dominance requires the steady infusion of new technology, information superiority, and modernization and replacement of equipment. The Joint NBC Defense Concept supports these visions and establishes a common framework for synchronizing future joint operational capabilities that, in turn, influence the development of NBC Defense doctrine, force structure, training, and materiel.

Stand-off and point land, air, sea, and space-based NBC networked detectors and sensors, combined with NBC reconnaissance systems, will provide early and selective warning to affected units and common situational awareness of NBC hazards to commanders throughout the battlespace. This will allow commanders to minimize the number of troops in protective posture and immediately react to hazards, utilizing clean areas to facilitate **dominant maneuver** and **engage** enemy forces **with precision**.

Protective suits that are lighter with less heat retention, masks having less breathing resistance and better visual acuity, medical pretreatments and vaccines against threat CB agents, and collective protection systems that provide shelter for command and control, rest and relief, medical operations, and vehicles will provide traditional **full-dimensional protection** against WMD while minimizing degradation and preserving OPTEMPO and overall lethality.

To deliver **focused logistics** at strategic and tactical levels in sufficient quantities and at the appropriate time, U.S. embarkation points and host nation port facilities and maintenance/supply depots must be able to recover from the effects of CB threat agents and

bring personnel, equipment, facilities, and maneuver areas to reliably safe levels of operation. Collective protection shelters, decontamination operations, agent monitors, and effective medical treatments support such restoration operations, and help to ensure uninterrupted cargo and personnel throughput. By extending protection and decontamination equipment to generally unprepared civilian support crews, the impact on combat power projection of limited, even localized NBC attacks may be further reduced.

4.0 Implementation

Successful implementation of the Joint Service CB Defense RDA Plan requires continuous incremental investment in the materiel acquisition process: its people, industrial base, infrastructure, and programs. The key to modernization is reducing the time necessary to field new systems or to integrate emerging technologies into existing systems. This will be accomplished using Advanced Concept Technology Demonstrations (ACTDs), open systems and architectures, and an emphasis on performance standards and best commercial practices. ACTDs are an integral element for transforming the acquisition process and accelerating the application of mature technologies to operational needs. The ACTD process permits the early evaluation of mature advanced technology to meet the needs of the warfighter. ACTDs also allow the warfigher to determine military utility and to develop and refine operational concepts to take full advantage of new capabilities. The CBDP has effectively used the ACTD concept and continues to do so. ACTDs are discussed in section 10.0. Additionally, the CB Defense programs will pass cost reductions to the users by applying design-to-cost and concurrent science and engineering concepts to ensure that equipment is easy to deploy, maintain, and repair. Modernization through the "spares and repairs" process itself will be institutionalized, and technology insertions simplified through the adoption of modular and open-systems designs.

Specifically, the JSMG's process will:

- Continuously identify and nurture promising CB defense science and technology through the Joint Science and Technology Panel for CB Defense.

- Oversee materiel development in accordance with the Program Strategy Guidance, and with CINC and Service priorities, balancing warrior requirements against available resources and technical and industrial base manufacturing capabilities.

- Integrate Joint Service research, development, testing, procurement, and military construction to leverage resources, eliminate duplication, and expedite fielding. Advocate cooperative R&D with Other Government Agencies (OGAs) and academia, and promote international partnerships.

- Continue to incorporate SOF requirements into the RDA process.

- Promote dual-use technologies to support demilitarization, NBC counterproliferation, and non-military applications, including law enforcement.

- Utilize the User Battle Lab concept and other Joint Service war-gaming tools to enhance materiel acquisition, as a function of value-added or to understand desired performance characteristics against realistic user needs.

- Test the military utility of concepts and equipment and shorten program acquisition time using ACTDs and the development of modeling and Distributed Interactive Simulation (DIS) techniques.

- Use performance specifications and standards rather than military specifications and standards, when appropriate.

- Ensure NBC contamination survivability for all CB defense equipment, and horizontally integrate CB defense and NBC contamination survivability technology across all major weapon systems.

- Integrate logistics and industrial base planning to support sustainment of two nearly-simultaneous MTWs.

4.1 Coordination with Other Government Agencies (OGAs)

The DoD CB defense community is actively coordinating with the Department of Energy (DOE) and the Defense Advanced Research Projects Agency (DARPA) to ensure the programs are integrated to leverage the best capabilities for the warfighters. DARPA is pursuing the development of technologies with broad applicability against classes of threats. DARPA invests primarily in the early, technology development phases of programs. Current efforts focus on work in sensor technology, advanced diagnostics, unconventional pathogen countermeasures, external protection, genomic sequencing, consequence management, and micro-fluidics.

DOE's Chemical and Biological Nonproliferation Program (CBNP) was established to ensure the full engagement of DOE National Laboratories in responding to the threat posed by chemical and biological weapons to U.S. civilians. The CBNP is structured along three principle elements: Analytical Studies, Technology Development, and Domestic Demonstration and Application Programs (DDAPs).

Many of our objectives are best achieved or can only be achieved by leveraging opportunities created through coordination with other government agencies. Each appropriate commodity area in Section D of this plan will discuss the integration of DARPA's and DOE's capabilities.

4.2 Nuclear, Biological, and Chemical Contamination Survivability (NBCCS)

The DoD CB Defense Program sponsors have prepared a performance plan that must "establish explicit and outcome oriented goals linked to a warfighters' ability to fight, survive, and win in a CB environment." To meet this goal, military departments have invested heavily in state-of-the-art technology systems to give U.S. Forces an edge in battle. This edge can be lost if either NBC contamination or the decontamination process causes mission essential materiel to

malfunction or fail (HARDNESS), to be inoperable by personnel in protective posture (COMPATIBILITY), or to be unrestorable to safe levels of cleanliness such that personnel may remove burdensome protective equipment without fear of ill-health from residual agent effects (DECONTAMINABILITY). These issues are especially critical for CB defense materiel, which is inherently designed for use in contaminated environments.

The NBCCS program is mandated and described for mission essential materiel in DoD Regulation 5000.2-R. Mission critical systems and equipment hardened against WMD effects remain a vital element in support of the Services' mission of deterrence and have the support of the Office of the Secretary of Defense (OSD) senior leadership. The NBCCS program includes not only the ability of structures, areas, personnel and objects to withstand the deleterious effects of CB agents, but also to restore normal OPTEMPO through decontamination.

Program Managers must address NBC Contamination Survivability requirements early in the development cycle, and monitor their progress at each milestone review. Specific engineering design criteria for NBCCS, as outlined in QSTAG 747, Edition 2 and Allied Engineering Publication (AEP-7, Edition 3) must be applied to each acquisition in order to allow for survivability testing and assessment. The use of Commercial Off-The-Shelf (COTS) and Non-Development Items (NDI) does not negate the requirement to be NBC survivable.

The JSMG continues to provide consultation and assistance with NBCCS concerns to program managers and DoD contractors through the Process Manager for NBCCS.

In the past year, a U.S. Army group of NBCCS professionals met periodically under the leadership of the U.S. Army Nuclear and Chemical Agency (USANCA) to address potential inconsistencies in the way NBCCS is considered in Army programs when mission critical systems and equipment are developed and fielded. As a result, there will be process improvements to ensure greater attention is given to the NBCCS aspects of developing mission critical equipment for all Services.

5.0 NBC Defense Capstone Acquisition Roadmaps

The NBC Defense capstone acquisition "roadmaps" (Figures C-1-a, C-1-b, C-2-a, and C-2-b) display CINC requirements against the planned timeframes in which the warfighters can expect to see NBC Defense items in the field. The timeframes are defined as near-term, (today through FY02), mid-term (FY03 to FY07), and far-term (FY08 to FY17). The roadmaps outline the variety of necessary equipment to defend against shortcomings in any one system. As a reflection of the capstone acquisition strategy, these figures show the overall plan to field capabilities against shortfalls in contamination avoidance and battlespace management, protection and restoration operations.

The R&D Initiatives roadmaps (Figure C-1-a & C-1-b) bring together the developmental cycles of all CB Defense programs. Likewise, the Fielded Capabilities roadmaps (Figure C-2-a & C-2-b) are an overview of biological, chemical, and radiological Defense equipment in the DoD inventory. Programs can be tracked from the R&D Initiatives roadmaps to the Fielded Capabilities roadmaps. For example, the R&D Initiatives roadmaps show that the Joint Service

Aircrew Mask (JSAM) is in development from FY00 through FY05. It can then be seen as a fielded program on the Fielded Capabilities roadmaps, starting in FY06. The CINC requirements are married to program timelines, with either development strategies or operational benefits summarized on the far right.

In review, the capstone acquisition strategy treats the compendium of materiel commodity areas as a system which, when integrated with medical prophylactics and treatments, and theater logistics sustainment processes, forms the pillars of effective biological, chemical, and radiological Defense planning. The DoD CBDP is developing its six commodity areas to address the NBC Defense JFOCs and to support CINC requirements under this strategy.

Research and Development Initiatives

CINC Requirements

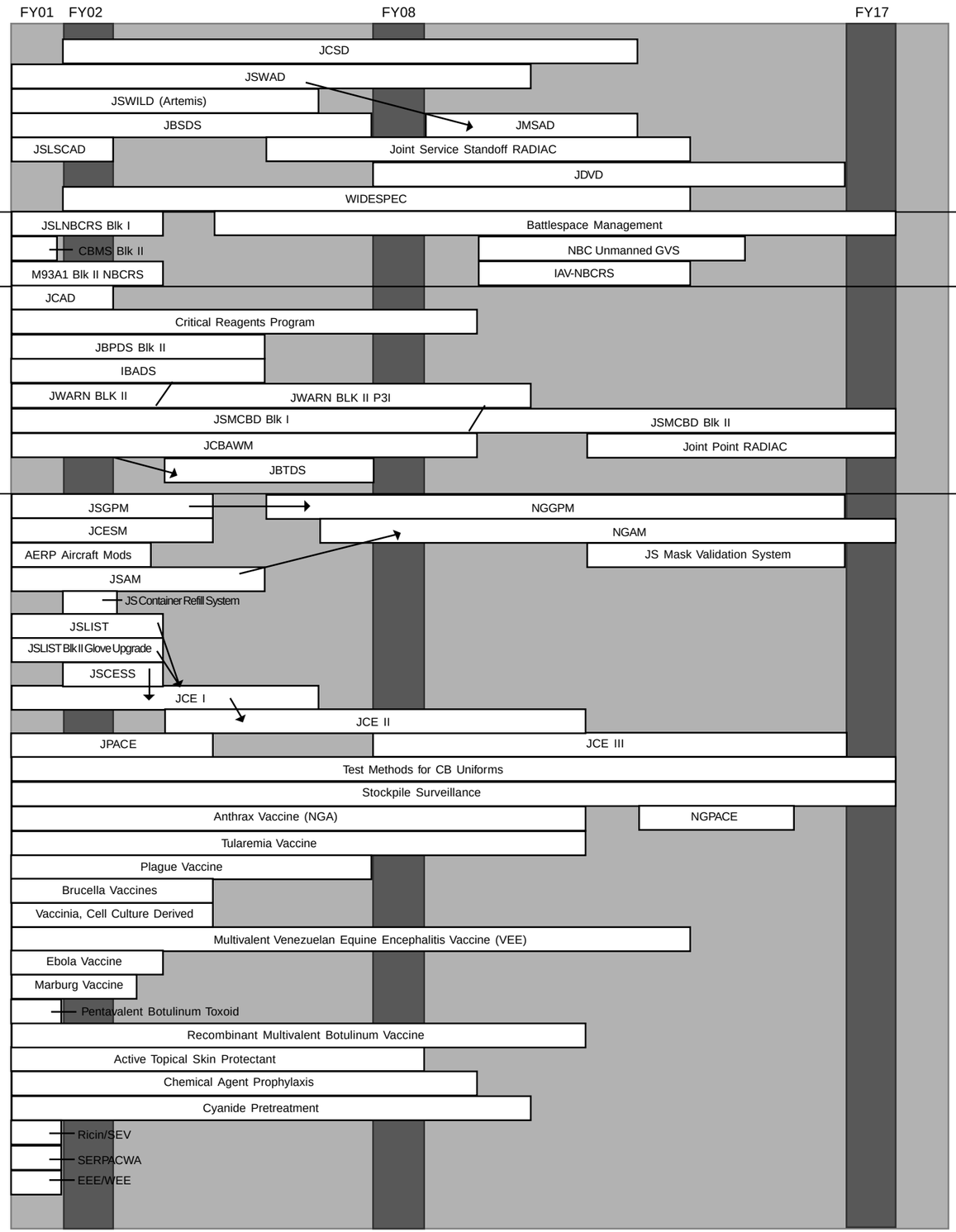
View the theater area of operations

Determine the battlespace through RSTA

Enhance situational awareness of unit battlespace

Provide real-time hazard information to influence current operations

Enhance personnel and equipment survivability



Program Strategies

Near-Term - Complete eye-safe laser for stand-off detection and increase range to 10 km; complete development of a passive, stand-off chemical detector to provide real-time, 360 degree, on-the-move operation.

Mid-Term - Complete development on an active laser-based system, capable of detecting and mapping chemical agent vapors and aerosols at distances of up to 20 km; increase capability to discriminate and identify BW agents up to 30 km using stand-off technologies; complete tech base of a stand-off aircraft detector that will provide an audio alarm and low spatial resolution look ahead map of chemical clouds.

Far-Term - Finalize development of the Joint Decontamination Visualization Detector to determine "how clean is clean"; development of the stand-off radiac system is complete; begin development of the vapor, aerosol, and liquid recorder/alarm.

Near-Term - Complete development of a reconnaissance system that provides automated hazard detection, reporting and mapping; detect and classify biological agents for reconnaissance vehicles.
Mid-Term - Begin planning for a battlespace management system.
Far-Term - Demonstrate the capability to have a single, integrated NBC reconnaissance platform that utilizes sensor technologies; enhance stand-off capabilities.

Near-Term - Demonstrate a small, lightweight detector that automatically detects chemical agents at very low concentrations to avoid meiosis.

Mid-Term - Complete development of a detector that can identify up to 26 biological agents while reducing size, weight, and power requirements; provide point and early warning CB agent detection for all Services.

Far-Term - Enhance situational awareness by offering an immediate and near-real time capability to warn adjacent, lower and higher units by being compatible and integrated with the C^4I^2 systems and networks; identify BW agents and other pathogens in collected clinical specimens and environmental samples.

Near-Term - Complete development of vaccines for filoviruses; continue development of a less bulky general purpose mask that reduces breathing resistance and improves comfort and protection; improve chemical protection of suits up to 60 days while reducing heat stress and improving interfacing with other equipment.

Mid-Term - Complete development of vaccines for Tularemia, Q-fever, Plague, Brucella, Vaccinia; begin improving materials and composites for mask fabrication and improved filter materials; complete development of a one size fits all, disposable, short duration mask for unique mission conditions; demonstrate decontamination for sensitive equipment.

Far-Term - Integrate CB protection into a combat ensemble that combines chemical, biological, ballistic, flame, infrared, and environmental protection; continue development of a common chemical ensemble; continue development of new methods to validate the effectiveness of protective equipment.

Figure C-1-a

Research and Development Initiatives

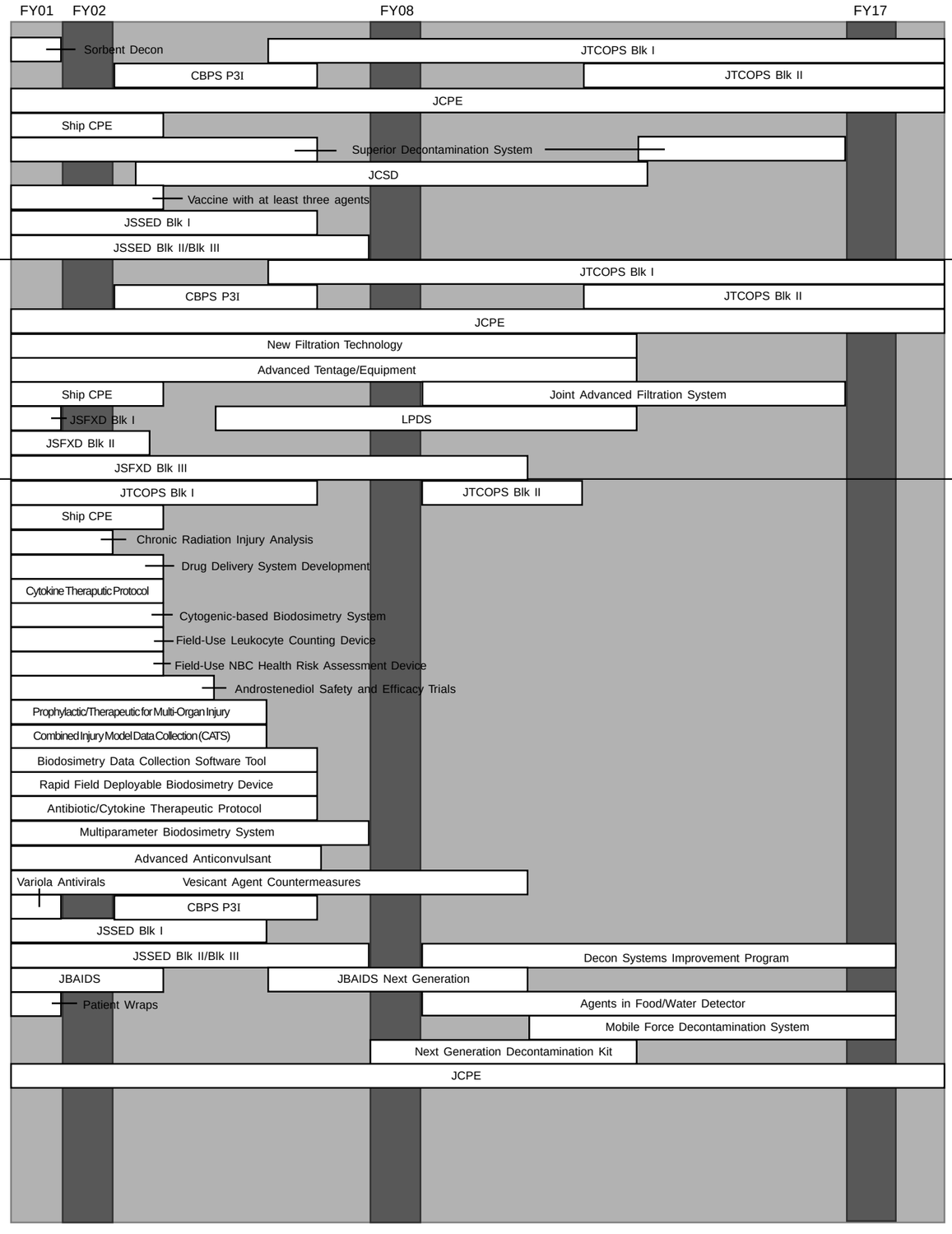
CINC Requirements

Program Strategies

Enhance personnel and equipment survivability (cont.)

Maintain ground, air and maritime operational tempo

Sustain operations, recovery and reconstitution efforts



Near-Term - Complete development of a family of decontaminants that will detoxify, neutralize, and eliminate NBC hazards on personnel; continue development of a decontaminant applicator to be used at fixed site locations; complete incorporation of improved shipboard collective protection equipment into the fleet. Develop and insert new collective protection technologies in the areas of filtration and lightweight tentage.

Mid-Term - Continue development of an advanced, lightweight, highly transportable shelter sytem. Develop and insert new collective protection technologies in the areas of filtration and lightweight tentage.

Far-Term - Demonstrate a system of medical decontamination for fixed sites that minimizes health hazards, logistical support and stockpiling maintenance; continue advances in filter technology.

Near-Term - Enhance survival from acute radiation exposure through prophylactic and therapeutic drugs; enhance hematopoietic recovery; developed advanced diagnostic tools for field use. Develop and insert new collective protection technologies in the areas of filtration and lightweight tentage.

Mid-Term - Provide cabability to decontaminate sensitive equipment; continue development of diagnostic and identification systems. Develop and insert new collective protection technologies in the areas of filtration and lightweight tentage.

Far-Term - Address aircraft and vehicle interior decontamination requirements through the use of new decontaminants; demonstrate the use of forward deployable medical diagnostic kits for NBC hazards to allow medics to quickly evaluate, monitor, and treat troops prior to symptom onset.

Figure C-1-b

CINC Requirements

View the theater area of operations

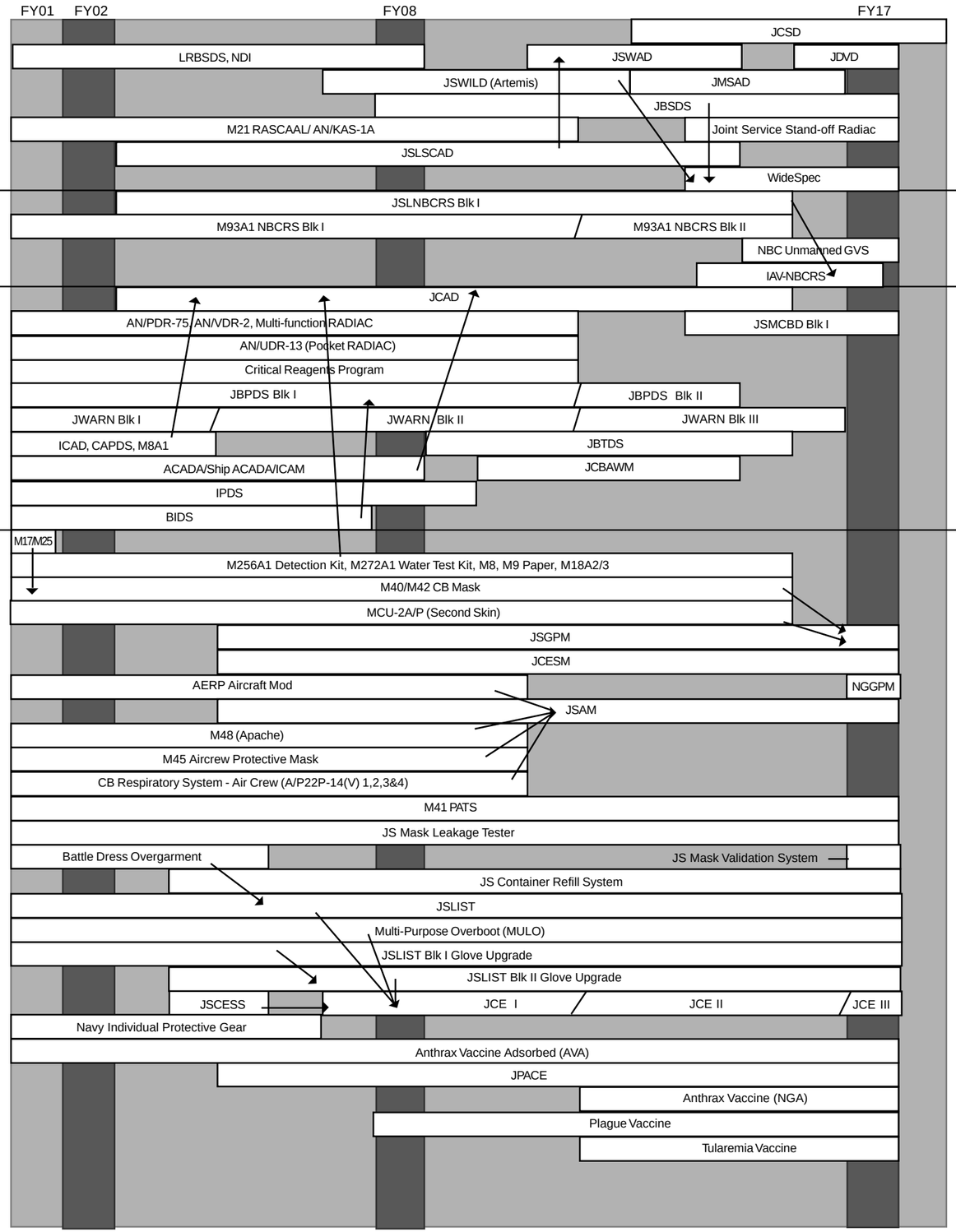
Dominate the battlespace through RSTA

Enhance situational awareness of unit battlespace

Provide real-time hazard information to influence current operations

Enhance personnel and equipment survivability

Fielded Capabilities



Program Strategies

Near-Term - Early warning, stand-off detection capability to identify chemical vapors for up to 5km; early warning by distinguishing man-made and natural aerosol clouds out to 30km.

Mid-Term - Integration of the Services requirements to provide on-the-move, stand-off chemical detection capability for ground, sea, and airborne platforms; capability to detect and map chemical agent vapors and aerosols at distances of up to 20km.

Far-Term - Effective passive detection system capable of imaging chemical agent vapors at high speeds from a variety of altitudes of up to 100km, and low earth orbit satellites; discrimination and identification of biological warfare agents up to 30km away using stand-off technologies; integration of chemical vapor contamination detection on runways and landing zones into a pilot's display system.

Near-Term - A single reconnaissance system for all Services and applications, which will include a biological detection capability and a stand-off, on-the-move detection system.

Far-Term - Single, integrated NBC reconnaissance platform that utilizes sensor technologies, such as remotely piloted vehicles, robotics, drop-off/scatterable sensors, and enhanced stand-off capabilities.

Near-Term - Point detection capability for all Services that identifies BW agent within 15 minutes or less; increase reliability and maintainability for point biological detection systems.

Mid-Term - Communication with all new detectors to greatly enhance situational awareness; immediate and near-real time capability to warn adjacent, lower, and higher units; increase detection and identification up to 26 biological agents while reducing size, weight, and power requirements.

Far-Term - Integration of the JCAD and downsized biological point detection capabilities into a signal system; integration of all chemical and biological stand-off detectors and wide area detection system through advances in nanotechnologies.

Near-Term - Personal warning devices allow individual initiative to react to the threat; multitude of protective masks and suits for Services protect against CB agents, permitting ability to continue mission with some degradation of combat abilities; verification of proper fit for individual protection equipment; improvements in chemical protection clothing to reduce heat stress, add fire resistance, and allow full compatibility with all interfacing equipment; protection against mustard and nerve agents using a topical skin protectant that prevents contact of agent with skin.

Mid-Term - Lightweight, disposable chemical environment suit and mask for short-term chemical agent exposure; procurement of a sole respiratory protection system for all ground/combat vehicle warriors and sailors; transition of a single protective mask for fixed and rotary wing aircrew; enhanced mask leakage testing system; protective posture improved through vaccine treatments for Q Fever, Plague, and Vaccinia.

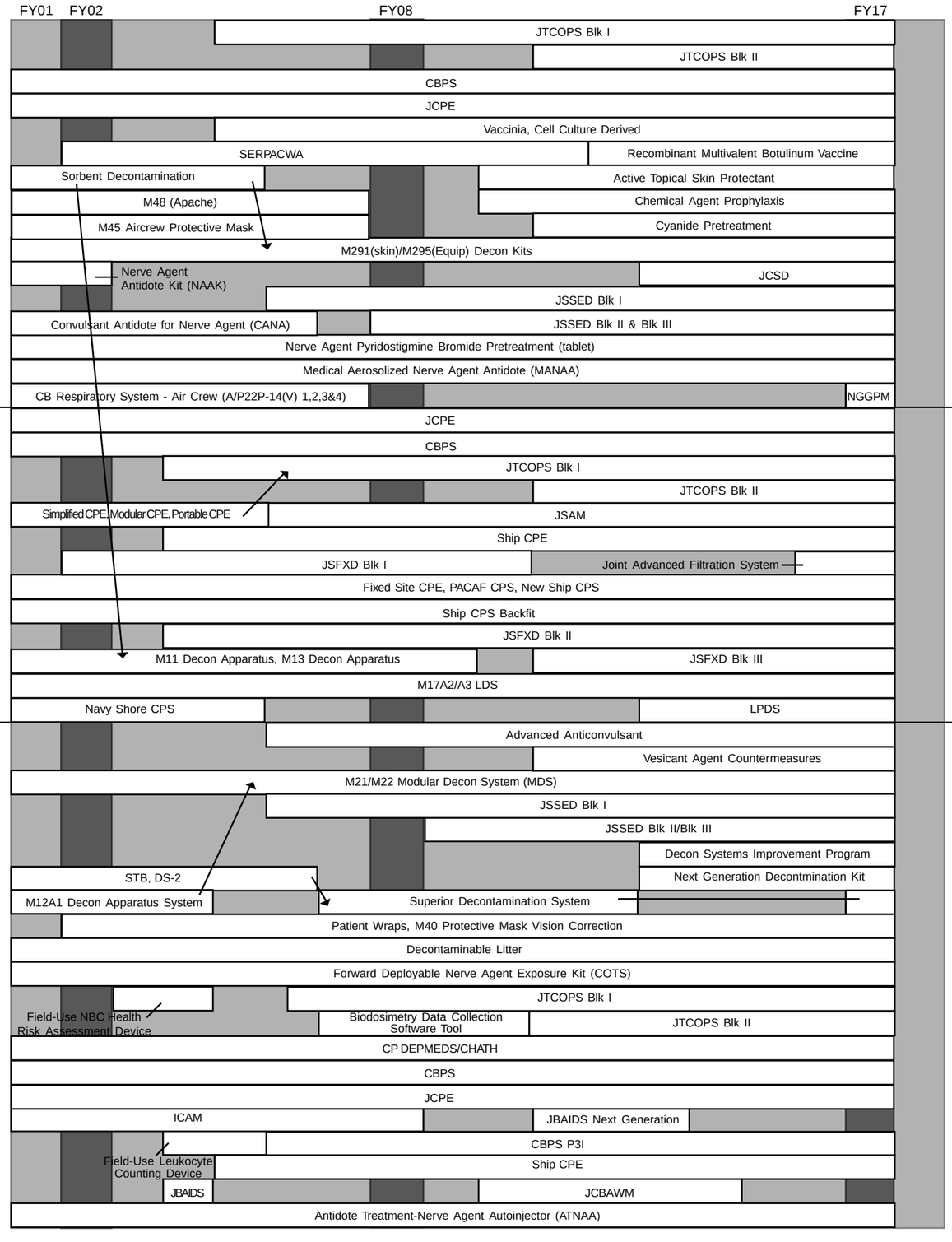
Far-Term - Ability to refill canteens and water distribution in a contaminated environment; increased protection by integrating CB protection into combat ensemble that combines chemical, biological, ballistic, flame, infrared, and environmental protection; system to decontaminate sensitive equipment; medical vaccine pretreatment possible for a multitude of biological agents.

Figure C-2-a

CINC Requirements

Fielded Capabilities

Program Strategies



Enhance personnel and equipment survivability (cont.)

Near-term - Most combat vehicles, communication shelters, artillery CPs, and ships operate with limited degradation from protective ensembles; improved decontaminants at fixed sites using existing dispersion mechanisms. Field incremental improvements to existing collective protection equipment by inserting new technologies. Increase number of collective protection platforms in the command/control, medical, and rest/relief areas.

Mid-Term - Improved decontamination apparatuses at fixed site locations to increase speed of recovery efforts; increased filter performance to improve the collective protection systems and ensure standardization. Field incremental improvements to existing collective protection equipment by inserting new technologies. Increase number of collective protection platforms in the command/control, medical, and rest/relief areas.

Far-Term - Decreased dependency on water for decontamination apparatuses, lightweight and portable, restoration and recovery operations will be enhanced.

Maintain ground, air and maritime operational tempo

Near-Term - Thorough decontamination cannot decontaminate all supplies and equipment; current fuel requirements for decontamination apparatuses create a heavy logistical burden; antidotes against nerve agents is simplified and quicker with a single auto injector; prophylactic and therapeutic drug combinations enhance survival from acute radiation exposure; highly mobile, environmentally controlled, collective protection systems for medical treatment facilities. Field incremental improvements to existing collective protection equipment by inserting new technologies. Increase number of collective protection platforms in the command/control, medical, and rest/relief areas.

Mid-Term - Advanced, lightweight, highly transportable shelter systems that all Services will use; decontamination capability for sensitive equipment; increased capability to quickly identify biological agents and other pathogens in collected clinical specimens and environmental samples; enhanced treatment for combined exposure to radiation, chemical and biological agents through the development of computer models with combined-injury casualty prediction capability. Field incremental improvements to existing collective protection equipment by inserting new technologies. Increase number of collective protection platforms in the command/control, medical, and rest/relief areas.

Far-Term - Enhanced decontamination with a less toxic decontamination solution that may be used in future application systems to provide a safe, effective decontamination capability for our forces; enhanced aircraft and vehicle interior decontamination; chemical and biological detection capability for a Joint Service water monitor; ability to decontaminate open wounds.

Sustain operations, recovery and reconstitution efforts

Figure C-2-b

Section D: CB Defense Commodity Areas

1.0 Introduction

The Capstone Acquisition Strategy is a business plan that establishes boundaries within which NBC Defense materiel acquisition is achieved. This section contains individual commodity area "roadmaps" that display the downselects, outselects, and transitions of capabilities through the POM cycle and into the out-years through FY17 to guide specific R&D programs toward joint modernization planning goals. The Joint Future Operational Capabilities (JFOCs) and their ranking by the JSIG (Appendix C) guide progress toward these goals. Each commodity area discussion contains a technology base overview, a mid- and far-term development plan, a graphical roadmap, and applicable operational impacts. Descriptive summaries of Defense Technology Objectives (DTOs), Research, Development, Test and Evaluation (RDT&E) and procurement programs and NBC Defense medical programs are provided in Appendices D, E, and F respectively. Projected funding levels and 2 MTW requirements for long-range planning to meet program objectives are provided in Appendices G and H, respectively. Funding is represented within the roadmaps by several categories, including Science and Technology (Budget Activity (BA) 1, 2, & 3), Development (BA 4 & 5), Procurement, and Sustainment. In addition, the roadmaps contain Initial Operational Capability (IOC) dates for select programs.

2.0 CB Defense Science and Technology Program

The CB Defense Science and Technology Program is devoted to the maturation of technology to counter the threat of CB weapons and to ensure the safety and mission effectiveness of U.S. forces operating within a contaminated environment with minimal impact on logistics. The CB Defense Science and Technology Program is divided into non-medical and medical areas, which support materiel development within each commodity areas. The CB Defense Science and Technology Program incorporates basic research, applied research, and exploratory development to develop future operational capabilities across multiple commodity areas.

3.0 Science and Technology Supporting CB Defense

In addition to the technology base thrusts supporting materiel development, the CB Defense technology base program incorporates basic and applied research in areas such as CB Threat Agents, Aerosol Technology, and CB Toxicology. This research supports development across multiple commodity areas. Understanding the CB threat (both established and emerging) drives the overall CB Defense Program. Toxicological determination of operationally and physiologically significant dosages of threat agents is fundamental to developing target requirements for materiel solutions across all commodity areas. Current airborne delivery mechanisms of CB materials include dissemination as aerosols; hence, applications of aerosol technologies and the development and characterization of advanced collectors and samplers are crucial enabling technologies.

3.1 Chemical and Biological Threat Agents

Investments are being made in the establishment of a comprehensive threat agent infrastructure, to acquire threat agents (both recognized and emerging) using chemical synthesis, biological manipulation, or procurement. Emphasis is placed on the characterization of the properties of the agents needed by Joint Service materiel and medical developers. Emphasis is also placed on developing appropriate simulants for use in the RDT&E process. Execution and funding of the work are integrated across non-medical, medical, and DOE performers and coordinated with the Intelligence community. Deliverables from this program are threat agents, technical data on threat agents, and simulants for developmental and operational testing.

3.1.1 Near-Term

A comprehensive stakeholder analysis will be completed to identify and prioritize the tasks to be addressed. Additionally, investments will be made to coordinate the measurement of agent properties across medical and non-medical DoD organizations and with DOE, to identify needed improvements in simulants, and to identify the recipients of emerging threat agent data. Research will be initiated on chemical, biological, and mid-spectrum agents, as identified by first priority tasks, such as data gaps and simulant deficiencies.

3.1.2 Mid-Term

Investments will be made to produce and toxicologically screen identified new threat materials, measure their chemical and biological properties, and fill identified data gaps for established threats. Simulants will be developed for chemical aerosols, microencapsulated viruses, stabilized bacteria, and proteinaceous and nonproteinaceous toxins/physiologically active compounds.

3.1.3 Far-Term

Close work with the Intelligence community will continue. This collaboration will enable identification of emerging threats and appropriate responses.

3.2 Aerosol Technology

Basic aerosol technology provides a capability to generate and characterize standard test aerosols and CB simulant aerosols in the field and in laboratory facilities, including chambers and wind tunnels. This aspect of the aerosol technology program is focused on quantitative analyses of aerosols to provide the contamination avoidance commodity area with systematic quantification of developmental aerosol collectors and their inlets, in order to accelerate the hardware development process. It also provides well-characterized aerosol challenges to support stand-off detection development.

A second area of emphasis is aerosol collector technology. This includes the design of improved aerosol inlets processing elements such as ducts, concentrators, and size-selective devices (e.g., impactors and cyclones), and collection devices for the aerosol particles. Goals for

technology advances needed to support the commodity area modernization goals are reduced size, weight, and power consumption, low/no consumables operation, and low temperature operation.

For medical CB defense, vaccines and prophylaxes must protect against a battlefield delivered dose of a CB threat. The CB medical technology program applies aerobiology, a specific focus of aerosol technology, to aid in evaluating the efficacy of medical countermeasures. A primary need for the support of the technology base, advanced developer, and the combat developer, in the execution of their joint mission to deliver effective solutions to medical Biological Defense (BD) requirements, is the standardization of estimates of battlefield-delivered doses.

3.2.1 Near-Term

Investments in a wind tunnel capability for a wide range of challenge aerosols at wind speeds up to 60 mph will be completed. Chamber and wind tunnel studies will be completed on developmental point detection hardware in support of the contamination avoidance commodity area. A new low power aerosol collector (under 100 watts at 500 liters/min), with at least 80% collection efficiency over the 1 to 10 micrometer particle size range, and capable of operation to -28^{o}C, will be demonstrated.

3.2.2 Mid-Term

New aerosol simulants from the threat agents program (e.g., chemical aerosols, microencapsulated viruses) will be integrated into the aerosol technology products, including specialty aerosol generators and analytical methods for wind tunnel and chamber investigations. Advanced methods for improving aerosol collection componentry will focus on even smaller, lower power devices so that point detection systems can realize the potential of miniaturization advances occurring in chemical and biological analyzers (e.g., lab on a chip). Emphasis will be placed on micromachining technology and novel methods of aerosol concentration, such as acoustic effects. A standard family of aerosol inlets appropriate to the range of Joint Service applications will be produced.

3.2.3 Far-Term

Aerosol-supporting technology will keep abreast of the emerging threat in aerosol form. Support of stand-off detection development may supplant point detection in the far-term as advancing sensor technology brings stand-off capability into the forefront of CB contamination avoidance development.

3.3 CW Toxicology

CW Toxicology data support all commodity areas, at all levels, including the establishment of requirements for protection, decontamination, and detection. Primary data gaps include the lack of complete agent dose-response curves and probit slopes. Secondary data gaps

include the toxicology of mixtures found in munitions and of by-products resulting from agent degradation or decontamination.

A multi-year program involving both the non-medical and medical communities is currently underway to address the toxicology issues of low level exposures to chemical agents. The issues of prevention, diagnosis, and treatment of persistent health effects are central aspects of the medical program. The toxicological emphasis is airborne exposure to low concentrations of agent for exposure durations extending out to several hours, determination of the lowest CB concentrations that are physiologically and operationally significant, and characterization of the concentration-time response curve. The data being generated address the issues and requisite data as outlined in "Life Sciences Data in DoD Chemical and Biological Modeling and Simulation" (1998 Lewis and Lorenz). The order in which the agents will be addressed is responsive to user input and requirements.

3.3.1 Near-Term

The technology to generate and analyze selected classical chemical agents is being developed. Concurrently, the miosis threshold for GB in rats is being determined, and an investigation of larger species for allometric modeling and extrapolation to the soldier has begun. In addition, sensitive methods of determining persistent health effects, particularly Central Nervous System (CNS)-mediated, of CB exposure are being developed.

3.3.2 Mid-Term

Toxicological testing of classical CB and emerging threats will be expanded to include multiple animal species, potency ratios (compared to GB), characterization of concentration-time response curves, and determination of the lowest physiologically significant concentrations. The development of toxicokinetic profiles of these agents will be investigated to determine if they are able to suggest mechanisms and treatments for persistent health effects.

3.3.3 Far-Term

Toxicological testing, including multiple animal species, potency ratios (compared to GB), characterization of concentration-time response curves, and determination of lowest physiologically significant concentrations of classical CB and emerging threats, and development of toxicokinetic profiles of these agents will be completed. This testing will investigate agent interactions, TICs, and emerging threats, both 4th generation and beyond.

3.4 BW Toxicology

BW Toxicology data supports all commodity areas at all levels to include establishing requirements for protection, decontamination, and thresholds for detection. Significant work remains in the areas of defining the infectious dose levels for each BW agent in operational, materiel development, and testing terms.

4.0 Contamination Avoidance Commodity Area

The contamination avoidance commodity area supports all four areas of the Joint NBC Defense Concept and the Battle Management and Contamination Avoidance Functional JFOCs. It incorporates and integrates stand-off and early warning; reconnaissance; biological, radiological, and chemical point detection; and information processing technologies. The associated programs are illustrated on the contamination avoidance commodity area roadmap in Figures D-1-1 through D-1-3.

Contamination Avoidance Objectives:

Mid-Term (FY03-07)

- Chemical and Biological Agent Early Warning
- NBC Reconnaissance
- Biological Point Detection
- Lightweight Chemical Agent Detector
- Automated Networked Warning, Reporting, and Hazard Prediction
- Networked, Early Warning Biological Detection

Far-Term (FY08-17)

- Integrated CB Early Warning Detection, Ranging, and Tracking
- Contaminated Surface Stand-Off Detection
- Multispectral CB Detector
- Unmanned Ground Vehicle System
- Chemical Warning and Identification LIDAR Detector
- CB Agent Water Monitor
- Modular CB Detector

The goal of battlespace contamination avoidance is to provide a real-time capability to detect, identify, map, quantify, and warn against all NBC warfare agents and TIMs below the incapacitating or infectious threshold value. Non-developmental systems are being assessed and a number of stand-alone sensors have been fielded or will be fielded to meet near-term needs as detection technology matures. Examples of these systems include advanced and multipurpose alarms for aircraft-, vehicle-, ship- and man-portable detection systems, such as: the Automatic Chemical Agent Detector and Alarm (ACADA), the Improved (Chemical Agent) Point Detection System (IPDS), the Joint Service Lightweight Stand-off Chemical Agent Detector (JSLSCAD) for chemical agents, the Biological Integrated Detection System (BIDS), the Interim Biological Agent Detector (IBAD) system, the Portal Shield system and the Joint Biological Point Detection System (JBPDS) Blk I for detection of biological agents.

The development and fielding of long-range CB detection, stand-off and early warning networked systems are currently programmed, as are improvements in full-body radiation dosimeters. Mid-term and far-term technologies will allow integration of CB point and stand-off detection modules into a single system. In FY17, the Vapor, Aerosol, Liquid Recorder/Alarm (VALRA) program will be initiated to examine the very challenging goal, set by the Joint Service Modernization Plan, to achieve a single multipurpose field detector.

The technology focus is on increased detection sensitivity, lower detection thresholds, specificity across the evolving spectrum of threat agents, range, signature, false alarm rate reduction, and integration of NBC detectors into various mapping and communications networks

via the Joint Warning and Reporting Network (JWARN) system to provide common warning and reporting to the Joint Force. In addition to these technology focus areas, major thrusts include: total ownership cost, weight, size, complexity of use, open architectures and modularity for future upgrades, and power consumption.

Special Operations Forces have requirements for several unique contamination avoidance capabilities. These include rapidly detecting, precisely locating, and accurately classifying fixed and mobile WMD threats from stand-off distances and rapid detection and accurate classification point detection capabilities. This would include detecting and identifying chemical and biological agents in both semi- and non-permissive, as well as remote and austere environments.

The NBC Defense JFOCs describe the operational capabilities required by the warfighter to meet the challenging goals set by the Joint Service NBC Defense Modernization Plan. A complete listing of the most current JFOCs is contained in Appendix C.

4.1 Technology Base

The contamination avoidance technology base feeds four major development areas. The first is stand-off detection, which includes detectors that "look out across the battlespace." The second is early warning detection, which includes remote applications (e.g., sampling devices and detectors on airborne platforms including Unmanned Aerial Vehicles (UAVs), or detectors distributed upwind from a unit with automatic communication to the unit). The third is point detection, which encompasses both chemical and biological agent detectors. The fourth is information processing and dissemination, which involves collecting and processing detection system information and disseminating it through existing networks (e.g., Global Command and Control System (GCCS)). These major development areas are fed by technology thrust areas: biological identification, reagent development, chemical/biological identification in food/water, integrated chem/bio point detectors, chemical stand-off, biological stand-off, integrated chem/bio stand-off detectors, CB environment, and CB battle management. These technology thrust areas are described in the following paragraphs.

4.1.1 Stand-Off/Early Warning Detection Technology Base

The technology base for the mid- and far-term have implemented a series of three technology thrust areas that will support the next generation of stand-off capabilities as projected in the JFOCs.

4.1.1.1 Chemical Stand-off

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The desired capability from this thrust area is the ability to provide early warning to the presence of CWAs. This capability will allow the warfighter time to assess and make command decisions to best protect the force while maintaining combat effectiveness. The focus is on technology that does not require the collection of a sample, has the potential to rapidly scan large areas in a short timeframe, and the ability to be used in a wide range of platforms (ground, air, and sea). The major JFOC addressed is Contamination Avoidance – Chemical Early Warning (CA-CE). The mid- and far-term objectives are to transition technology to support the Joint

Service Warning and Identification LIDAR Detector (JSWILD/Artemis), the Joint Miniature Stand-Off Agent Detector (JMSAD), the Joint Service Wide Area Detection (JSWAD), the Joint Contaminated Surface Detector (JCSD), and the "WideSpec" program.

This thrust area is currently supported by two DTOs; CB.07 – Laser Stand-off Chemical Detection Technology and CB.19 – Chemical Imaging Sensor. The Laser Stand-off DTO will be completed in FY01 with a demonstration of an active LIDAR system with capabilities out to 20 km. The Chemical Imaging DTO is expected to be completed in FY02 with a demonstration of a prototype system using 16-pixel imaging at a rate of 360 scans per second. The current direction of technology is in the infrared region (9 – 12 μm) of the electromagnetic spectrum. It is expected that the technology will expand into other regions of the electromagnetic spectrum, (e.g., Raman and millimeter wave).

4.1.1.2 Biological Stand-off

The desired capability from this area is the ability to provide early warning to the presence of biological warfare agents. This capability will allow the warfighter time to assess and make command decisions to best protect the force while maintaining combat effectiveness. This thrust area focuses on technology that does not require the collection of a sample, has the potential to rapidly scan large areas in a short timeframe, and the ability to be used in a wide range of platforms (ground, air, and sea). The major JFOC addressed is Contamination Avoidance – Biological Early Warning (CA-BE). The mid- and far-term objectives are to transition technology to support the Joint Biological Stand-off Detection System (JBSDS), JSWAD, JCSD, and "WideSpec."

This thrust area is currently supported by a new DTO, CB.35 – Stand-off Biological Aerosol Detection. This DTO is expected to be completed in FY04 with a demonstration of detection at 25 km with a sensitivity of 15 Agent Containing Particles per Liter of Air (ACPLA) in "real-time." The current area of investigation is in the Ultraviolet Laser Induced Fluorescence (UV-LIF) regions of the electromagnetic spectrum. Preliminary efforts in other regions (e.g., infrared (3-5 and 9-12 μm) at higher detection sensitivities, Raman, and millimeter wave) as well as polarization techniques have shown potential to enhance discrimination on the detection of the biological materials.

4.1.1.3 Integrated Chemical/Biological Stand-off Detectors

This thrust area is driven by the need to reduce the overall number of systems that must be maintained in the field and has the goal to conceptualize, develop, and validate technology solutions that address with the same platform both chemical and biological threats. The major JFOCs addressed are Contamination Avoidance – Biological Early Warning (CA-BE) and Contamination Avoidance – Chemical Early Warning (CA-CE). The mid- and far-term objectives are to transition technology to support JSWAD, JCSD, "WideSpec," and Joint Decontamination Visualization Detector (JDVD).

Contamination Avoidance

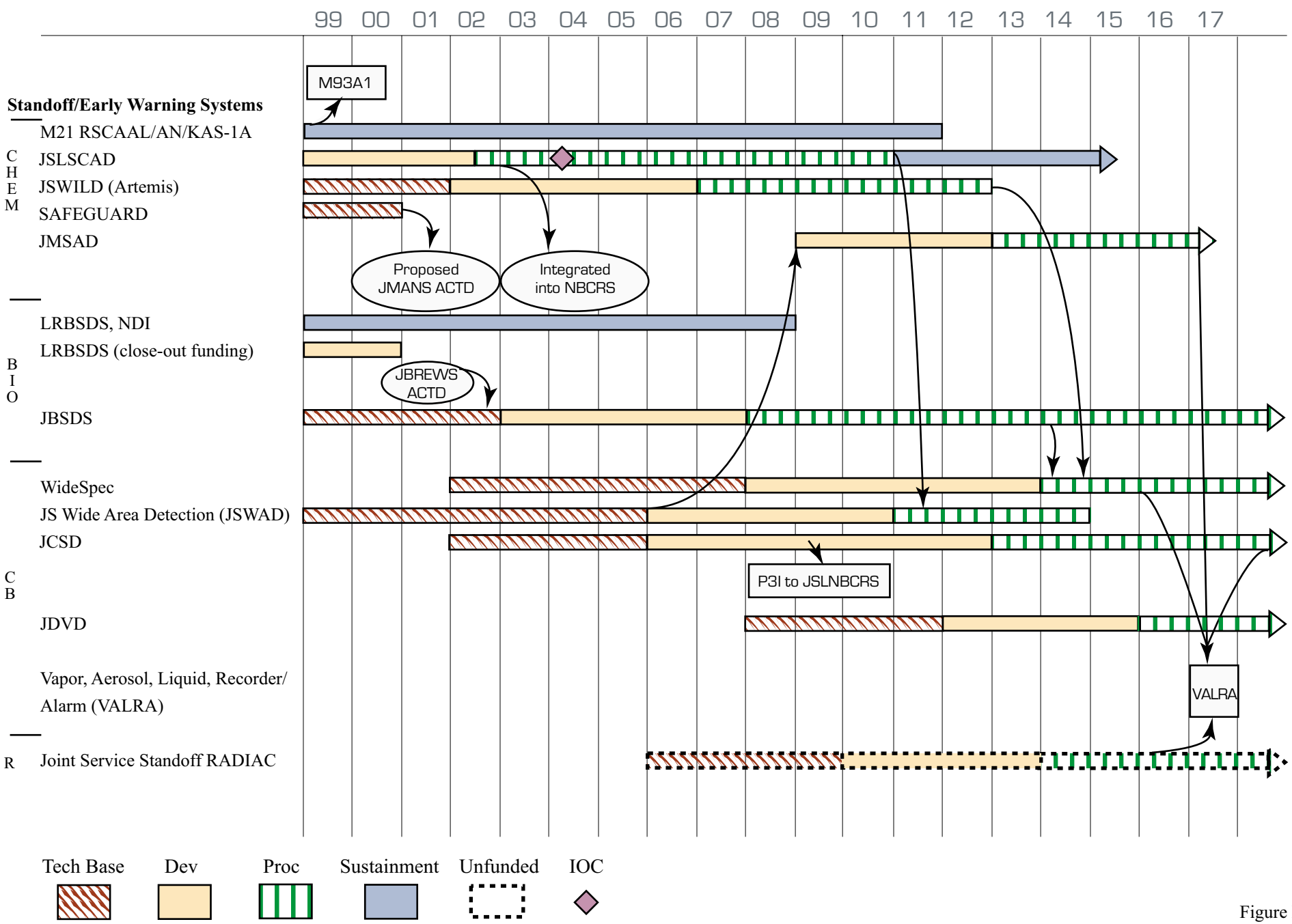


Figure D-1-1

Contamination Avoidance

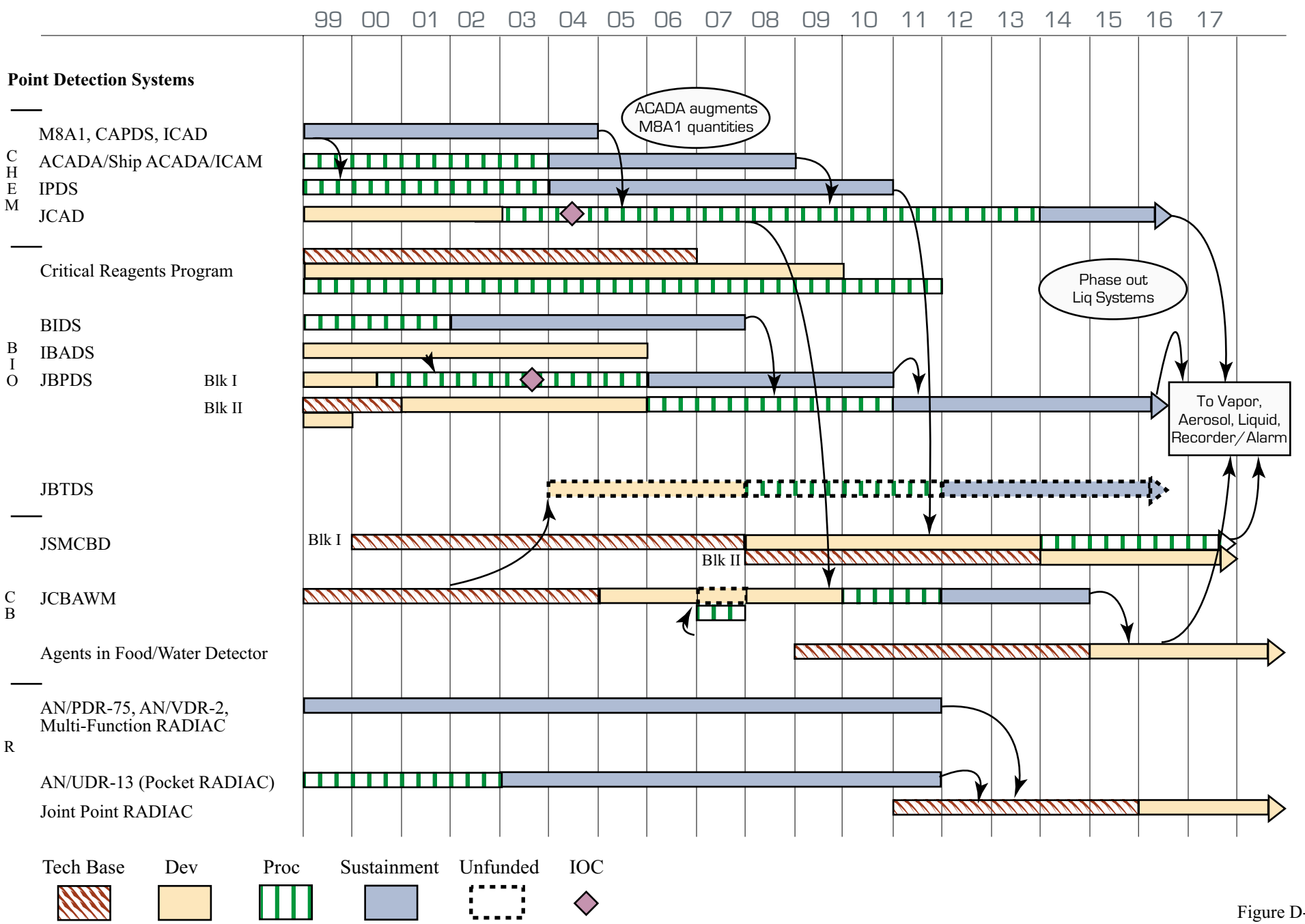


Figure D-1-2

Contamination Avoidance

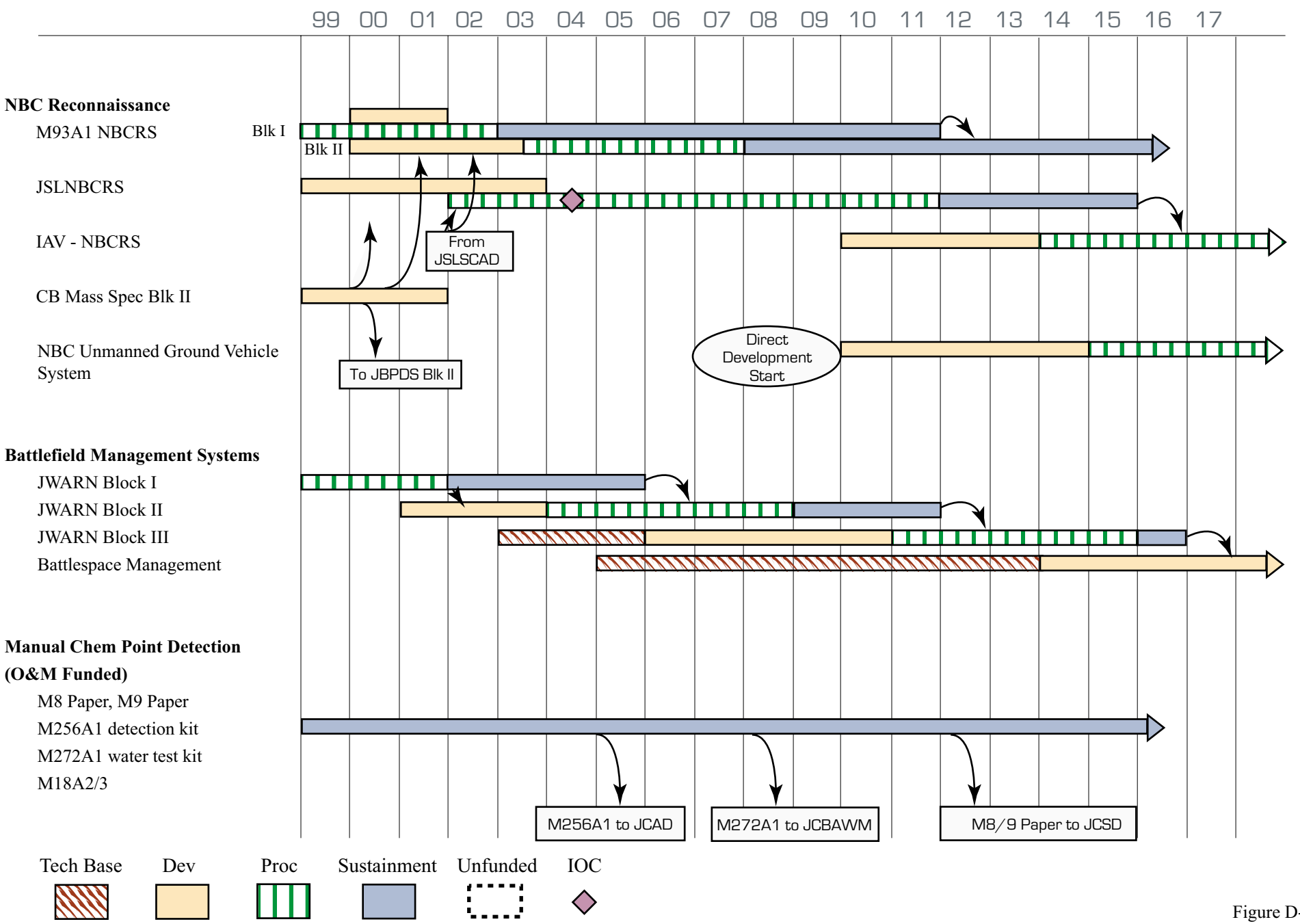


Figure D-1-3

4.1.2 Point Detection Technology Base

The technology base for the mid- and far-term has implemented a series of four technology thrust areas that will support the next generation of point capabilities, as projected in the JFOCs.

4.1.2.1 Biological Identification

The goal of this thrust area is to develop technologies to uniquely identify biological warfare agents. The current fielded capability relies on single use immunoassay technologies, which are intensely burdensome on logistics, reliability, and maintainability of existing systems. The technology focus is on development and validation of broad-spectrum identification and multiplexed assay techniques. The major JFOC addressed is Contamination Avoidance – Biological Point Detection (CA-BP). The near-term objective is to transition technology to support the JBPDS Blk II. The mid- and far-term objectives are to transition technology to support the Joint Service Multispectral Chemical Biological Detector (JSMCBD).

This thrust area is currently supported by a DTO; CB.20 – Biological Sample Preparation System for Biological Identification. This DTO will be completed in FY01 with a demonstration of sample preparation within 15 minutes. The current technological approach is to enhance the identification process by the use of genetic assays and techniques to multiplex assays. The ultimate approach is to develop new methodology/technology that does not require the use of consumables.

4.1.2.2 Reagent Development

The purpose of this area is to develop a new methodology to either greatly enhance the existing set of reagents that would impact, by at least an order of magnitude, the overall system performance (cost, logistical burden, etc.) or to develop reagents for threats that cannot be produced via current methodologies. The goal is to expand the current set of fielded capabilities in biological detection/identification to address the full threat list. The major JFOC addressed is Contamination Avoidance – Biological Point Detection (CA-BP).

The current technological approach is to modify supporting ligands to increase stability and sensitivity for existing reagents and the development of methodology for producing and stabilizing genetic assays for field use. In addition, methodology is being investigated to reduce the number of reagent sets needed to address the total number of threat agents, multiplexed assays.

4.1.2.3 Chemical/Biological Identification in Food/Water

The primary thrust in this area is the development of concepts/technologies to detect and identify contaminants in food and potable water. The traditional threat to the warfighter has been respiratory or percutaneous exposure to CB warfare agents, but with the change in global politics the threat has expanded to include force protection issues as well as the traditional battle/collateral damage problems. The major JFOC addressed is Contamination Avoidance –

Medical Surveillance/Veterinary Support (CA-MV). The mid- and far-term objectives are to transition technology to support the Joint Chemical Biological Agent Water Monitor (JCBAWM) and Agents in Food/Water Detector.

This thrust area is currently supported by a new DTO; CB.37 – CB Agent Water Monitor. This DTO is expected to complete in FY02 with a demonstration of a breadboard system to identify shortfalls. The DTO is expected to be the followed by a BA3 program to build a limited form, fit, and function prototype to demonstrate technology that will support JCBAWM. The current focus has identified the most mature technology that can be applied to this capability and is in development of test protocols to identify capabilities and shortfalls of the individual components. The effort also includes total system design, integration, and environmental characterization.

4.1.2.4 Integrated Chem/Bio Point Detectors

The far-term goal of the detection program is to provide technology solutions that decrease the number of individual detectors in the inventory, hence, decreasing the logistics burden associated with maintenance, training, and multiple operational concepts. It is also desirable to decrease size and cost of CB detectors. This thrust area focuses on conceptualization, development, and validation of technologies that provide small, lower cost, point detectors/identifiers that simultaneously address both chemical and biological threats. The major JFOCs addressed are Contamination Avoidance – Biological Early Warning (CA-BE), Contamination Avoidance – Biological Point Detection (CA-BP), Contamination Avoidance – Chemical Early Warning (CA-CE), and Contamination Avoidance – Chemical Point Detection (CA-CP). The mid- and far-term objectives are to transition technology to support JSMCBD and Agents in Food/Water Detector.

The current focus is on the capabilities to detect contaminants in water and a downsized biological point detector (less than a cubic foot and less than 30 lbs). The rationale for the focus on biological point detection is that chemical point detection has already demonstrated systems that can be handheld. Studies are underway to evaluate the theoretical limit on the minimum size that state-of-the-art (projected out to FY04) biological detection technology can provide. This will allow the efforts to be focused on the critical components that need to be enhanced to achieve the smallest sized system possible.

4.1.3 Information Processing and Dissemination Technology Base

The technology base has implemented two technology thrust areas that will support the next generation of information processing capabilities, as projected in the JFOCs.

4.1.3.1 CB Environment

This thrust area addresses the development of the capability to model and simulate CBW threats from vapor, liquid and solid agents across a range of scales from individual to theater. This requires realistic, rigorous treatment of environmental processes including agent dissemination, meteorology, complex terrain, high altitude behavior, and long-range downwind

transport. The major JFOC addressed is Battle Management – Battle Analysis (BM-BA). The current focus of this area is discussed in the modeling and simulation commodity area sub-section.

4.1.3.2 CB Battle Management

This thrust area develops the capability to utilize automatic collection and fusion of medical and non-medical information from all NBC defense assets throughout the battlespace and integrate with other relevant battlespace information and Command, Control, Communications, Computers, and Intelligence (C4I) systems. It will integrate items such as: threat information, CB sensor and reconnaissance data, protective posture, environmental conditions, etc., and other data pertaining to the CB conditions in the battlespace. This capability will allow for the rapid dissemination and display of operationally meaningful information to commanders and units at all levels to support decision making related to joint force protection, restoration of operational tempo, and casualty treatment and care. The major JFOC addressed is Battle Management – Battle Management Systems (BM-BS).

The current focus of this area is in understanding/integration of data available from non-traditional CB sensors (disparate sensors, e.g., firefinder/target acquisition radars and acoustic intrusion sensors). In addition, assessment tools are being developed to evaluate the value-added from the data available from these disparate sensors.

4.2 Stand-Off/Early Warning Detection Systems

4.2.1 Near-Term

Current and Near-Term Systems (FY01-02)

M21 (RSCAAL)
AN/KAS-1A
NDI LRBSDS
JSLSCAD

Current stand-off early warning detection capabilities include the ability to detect and identify chemical vapors for up to five km (M21 Remote Sensing Chemical Agent Alarm (RSCAAL) and the AN/KAS-1A). The M94 Long Range Biological Stand-off Detection System (LR-BSDS) Non-Development Item (NDI) provides discrimination and early warning of a potential BW attack out to 30 km by distinguishing between man-made and natural aerosol clouds. The M94 LR-BSDS program has been terminated upon the re-evaluation of the user's requirements.

The Joint Service Lightweight Stand-off Chemical Agent Detector (JSLSCAD) will provide a significant increase in performance over the M21. It integrates the requirements of the Army, Navy, Air Force, and Marine Corps to provide on the move, stand-off chemical detection capability for ground, sea, and airborne platforms.

The JBREWS ACTD demonstrated the feasibility of integrating an organic point BW detection capability and early warning capability through the utilization of a network array of point sensors and a stand-off capability provided by the Short Range-Biological Stand-off Detection System (SR-BSDS). This integrated network further integrated command, control, communication, and intelligence to provide a warning of a biological attack. The capabilities of the JBREWS ACTD are being considered in an Analysis of Alternatives study for the best

technologies and approaches to address a technologically challenging need by the user for early warning biological detection capability. These technologies are expected to feed into both the Joint Biological Point Detection System (JBPDS) Blk II, and the Joint Biological Stand-off Detection System (JBSDS).

4.2.2 Mid-Term

Mid-Term Systems (FY03-07)

Artemis

The proposed Joint Multi-mission Advanced NBC System (JMANS) ACTD will provide the Joint Forces with a real time NBC detection, warning, and reporting capability. This ACTD will focus on integrating relatively mature NBC sensors, along with other data, into the current battlespace management system. Stand-off detection systems under consideration for JMANS include the Scanning Airborne Emission for Gaseous Ultraspectral Analysis and Radiometric Detection (SAFEGUARD), the Joint Service Lightweight Stand-off Chemical Agent Detector (JSLSCAD), the JSWILD/Artemis, and the currently fielded M21 Remote Sensing Chemical Agent Alarm (RSCAAL). The JSWILD development program is also known as Artemis and is an active laser-based system, which will be capable of detecting and mapping chemical agent vapors and aerosols at distances of up to 20 kilometers. Additional capabilities for surface contamination mapping and limited biological detection are being explored.

4.2.3 Far-Term

Far-Term Systems (FY08-17)

JMSAD
JBSDS
WideSpec
JSWAD
JCSD
JDVD
Joint Stand-off RADIAC

Far-term efforts will investigate liquid, aerosol, and vapor detection with identification, ranging, and tracking. Two complementary systems are currently being developed which will provide these capabilities.

The first system, the Joint Miniature Stand-off Agent Detector (JMSAD) will be designed to operate as part of the aircraft avionics. This ultra lightweight (less than 3 lbs.) passive detector will provide an audio alarm and low spatial resolution look ahead map of chemical clouds. It will be integrated into the pilot's display system to visually indicate turn vectors for hazard avoidance. It will further detect chemical vapor contamination on runways and landing zones.

The second, the JSWAD, is a small, lightweight, cost effective passive detection system, which will be capable of imaging chemical vapors and potential biological agent aerosol vapors at high speeds from a variety of platforms, including ground vehicles, low and high flying aircraft (including UAVs) at altitudes of up to 100 km, and low earth orbit satellites.

Parallel to this effort, the Wide Spectrum "WideSpec" will be developed to respond to the Joint Service need for a detector capable of detecting an extremely wide range of CB agents including classical chemical and biological agents, as well non-traditional agents such as genetically engineered materials or chemical agents not found in first, second, and third generation categories.

In addition, the Joint Contaminated Surface Detector (JCSD) and the Joint Decontamination Visualization Detector (JDVD) are being developed which target three applications; a replacement for the sampling wheel on the NBC Reconnaissance Vehicle, a replacement for the CAM, and a technique for visualizing decontamination effectiveness. The JCSD will be capable of detecting CB contamination on surfaces from a variety of platforms, including the NBC Reconnaissance System, while the JDVD will be an imaging system used for "seeing" residual CB contamination on vehicles (and other military materiel) in order to assess decontamination effectiveness. Several approaches are being investigated including a liquid ground detection system based on a hybrid concept (active/passive) called thermoluminescence. This system will be capable of detecting liquid ground contamination from both ground and air platforms (including UAVs) at ranges of up to 500 meters. Raman, passive (e.g., JMSAD, JSWAD), and laser based approaches (e.g., Artemis) are also being considered. The Joint Biological Stand-off Detection System (JBSDS) requirement is currently in draft to address the capabilities of discriminating and identifying biological warfare agents up to 30 km away using stand-off technologies. This will be completed in FY07/08. The Joint Service Stand-off RADIAC will detect nuclear contamination and is currently scheduled for production in FY14.

4.3 Reconnaissance Systems

4.3.1 Near-Term

Current and Near-Term Systems (FY01-02)

JSLNBCRS
NBCRS Blk I

The current reconnaissance capability is the M93A1 Fox NBC Reconnaissance System (NBCRS) Blk I for heavy units. For the near-term, the JSLNBCRS will complete development and is scheduled to transition to production in FY01. Currently, the target vehicle for the system is under review. Part of this effort is to examine the feasibility of a single reconnaissance system for all Services and applications. Both the Fox Blk II and the JSLNBCRS will incorporate the Chemical Biological Mass Spectrometer (CBMS) Blk II and the JSLSCAD beginning in FY02. This JSLNBCRS will also be fitted with the JBPDS. This will mark the first time that NBC reconnaissance systems will have a biological detection capability.

4.3.2 Mid-Term

Mid-Term Systems (FY03-07)

NBCRS Blk II

For the mid-term, the NBCRS Block II will incorporate next generation CB detection capabilities. These capabilities will include: on-the-move stand-off chemical agent detection, improved detection and identification of liquid chemical agents, and for the first-time, a biological agent detection capability. Integration of the common NBC technical architecture will allow for expansion/upgrading of the on-board computers at minimal cost.

4.3.3 Far-Term

Far-Term Systems (FY08-17)

IAV-NBCRS
NBC Unmanned Ground Vehicle System

For the far-term, the Interim Armored Vehicle – NBCRS (IAV-NBCRS) will replace the M93A1 Fox and BIDS. It is a single, fully integrated, multifunctional NBC reconnaissance platform that utilizes sensor technologies such as remotely piloted vehicles, robotics, drop-

off/scatterable sensors, and enhanced stand-off capabilities.

The NBC Unmanned Ground Vehicle System (NBC UGVS) exploits the emerging tactical UGVS to supplement NBCRS operations. The tactical UGVS will have the latest versions of NBC point, stand-off, and surface detectors mounted on it, along with an automated marking system. The vehicle will be capable of operation in a Slave or Autonomous mode. All systems will report through an advanced JWARN network to the mother vehicle, as well as other vehicles, maneuver units, and fixed sites in the area.

4.4 Point Detection Systems

4.4.1 Near-Term

The current fielded chemical systems are M8/9 paper, M256A1/272A1/18A2/18A3 test kits, M8A1, Individual Chemical Agent Detector (ICAD), Chemical Agent Point Detection System (CAPDS), Chemical Agent Monitor (CAM), Improved Chemical Agent Monitor (ICAM), Improved (Chemical Agent) Point Detector System (IPDS), and the Automatic Chemical Agent Detector Alarm (ACADA) monitors/detectors.

Current and Near-Term Systems (FY01-02)

M8A1 M8 Paper
BIDS M9 Paper
ACADA AN/PDR-75
ICAD AN/VDR-2
AN/UDR-13 IBAD
CAM CAPDS
ICAM IPDS
ADM-300
Multi-Function RADIAC
M256A1 Detection Kit
M272A1 Water Test Kit
M18 A2/A3 Test Kit
Portal Shield (XM99)
JCAD
JBPDS Blk I

In the area of chemical point detection, the Services are currently procuring the ACADA. This program will augment, not replace, the M8A1 alarm due to limited quantities planned for procurement. The ICAM will enhance chemical point detection and monitoring capabilities in the near-term. The ICAM increases the reliability and reduces maintenance for CAMs already in the inventory. In addition, the Navy began deploying the IPDS in FY99 (procurement began in FY98).

Current point biological detection capabilities include the first biological detection systems, the BIDS NDI and pre-planned, product improvement (P3I). The BIDS is a land based, mobile detection system. The NDI version is capable of detecting and identifying four biological warfare agents in 45 minutes. The BIDS P3I was fielded in 4QFY99 to detect and identify eight agents simultaneously, within 30 minutes. Likewise, the Navy's IBAD utilizes off-the-shelf technology to provide the first biological detection capability on surface ships. Beginning in FY99 the CBDP began fielding the Portal Shield (XM99) to several Central and Pacific Command high value airbases and ports. The Portal Shield system provides the first biological detection capability to protect essential fixed sites from BW attacks. The system consists of multiple networked detectors mounted around the perimeter of a site providing near-real-time detection and identification of BW attacks. The Portal Shield system has transitioned from an ACTD to a formal production program and additional systems will be procured to support additional critical fixed sites. The JBPDS Blk I will replace all currently fielded biological detection systems. These include the IBAD and the BIDS and will be integrated into the JSLNBCRS and future BIDS companies. The JBPDS Blk I will be capable of detecting and presumptively identifying all International Task Force 6 Report Category A agents within 20 minutes. The JBPDS acquisition strategy focuses on system automation and maximizing

commonality of components to obtain the benefits of Joint interoperability and supportability, lower cost, and life cycle cost savings.

4.4.2 Mid-Term

In the mid-term, the procurement of the JCAD is scheduled to begin in FY03 and will replace the M8A1 detector, ACADA, and CAM/ICAM. The JCAD provides improved performance over existing fielded capabilities at a lower cost. This system will include detection and warning of the presence of nerve and vesicant agents in aircraft and shipboard interiors.

Mid-Term Systems (FY03-07)

JCAD
JBPDS Blk II

In the mid-term, the JBPDS Blk II will be capable of detecting and identifying up to 26 biological agents while reducing size, weight, and power requirements. This effort is supported by the Biological Identification and Reagent Development technology base thrust areas. Several programs from OGAs are being reviewed for their potential to transition technology into the Blk II program. These include:

- An Autonomous Pathogen Detector at the Lawrence Livermore National Laboratory (LLNL)
- DARPA's work at Argonne National Laboratory (ANL) on the "MAGIC Chip"
- DARPA's Tiny Time-of-Flight (TOF) Mass Spectrometer (MS) program at the Johns Hopkins Applied Physics Laboratory
- DARPA's program at the Stanford Research Institute for Upconverting Phosphors

4.4.3 Far-Term

Far-Term Systems (FY08-17)

JCSD
JSMCBD
JCBAWM
Joint Point RADIAC

In the far-term, The JCSD will be developed to replace M8/M9 paper. Beginning in FY14, the JSMCBD will provide point and early warning chemical and biological agent detection for all Services throughout the theater. Also in the far-term, chemical and biological point detection efforts will include the development and procurement of the JCBAWM. The technology base thrust areas of integrated chem/bio stand-off and point detector will support the JCSD and JSMCBD programs, the chem/bio identification in food/water supports the JCBAWM program, and the biological identification and reagent development thrust areas supports both biological detection/identification and medical diagnostic efforts, the Joint Biological Agent Identification and Diagnostics System, (JBAIDS). In addition, there are plans to consolidate the RADIACs (Radiation Detection, Indication, And Computation) (AN/PDR-75, AN/UDR-13, AN/UDR-2, ADM-300 and the Multi-Function RADIAC) into a Joint Point RADIAC before FY17. Currently, forces are receiving the AN/UDR-13 Pocket RADIAC. This replaces the IM-93 dosimeter with automated, digitized readouts.

4.5 Information Processing Systems

Warning and reporting is a critical capability in contamination avoidance. Commercially derived warning and reporting software was procured and will be fielded during FY02 to form JWARN. The JWARN will provide each Service the capability to improve operations and

survive in an NBC warfare threat environment. The JWARN will communicate with all new detectors using a standard built-in interface and with legacy systems using an external adapter, to greatly enhance situational awareness in the battlespace by offering an immediate and near-real time capability to warn adjacent, lower, and higher units. The JWARN will be compatible and integrated with the Joint Service Command, Control, Communications, Computers, Information and Intelligence (C4I2) systems and networks. The JWARN will provide additional data processing, production of plans and reports, analyses, and access to specific NBC information to improve the efficiency of limited NBC personnel assets. In the far-term, the JWARN Blk III program will improve system capabilities by FY06 from warning and reporting to a fully self-organizing, GCCS compatible battlespace information system, which is seamless between command levels and Services.

4.6 Operational Impacts

4.6.1 Near-Term

Commanders in the theater of operations will have a limited number of chemical and biological agent stand-off and point detectors. These will be allocated mostly to warn high priority areas and select units. Chemical agent vapor clouds will be identifiable up to five km away, but there will be only limited capability for detection of potential BW agent clouds prior to their reaching the force. Joint task forces will rely on Portal Shield (XM99), IBAD, and BIDS systems, to provide a limited capability to detect releases of BW agents. Maneuver elements will rely heavily on the M21 RSCAAL and M93A1 NBCRS Blk I to identify clean, chemical-free areas for maneuver. Light forces will not have a comparable capability. Critical logistical support functions will be slowed by much of the theater's remaining vulnerability to both chemical and biological agent contamination. The M93A1 NBCRS will provide a capability for Army and Marine Corps units to immediately identify clean, chemical-free versus contaminated areas based on the capability of the M21 RSCAAL. The remaining NBC sensor suite provides point detection and identification of the contaminant.

Ground maneuver units, NBC reconnaissance vehicles, and ships will benefit from the increased theater coverage provided by fielding a relatively large number of chemical stand-off systems (JSLSCADs). Miniature chemical agent detectors in aircraft, ship compartments, and on individual troops will provide advantages of a force multiplier by affordably and vastly increasing the number of potential detection and warning points throughout the theater.

4.6.2 Mid-Term

Development and procurement of JBPDS Blk II will provide enhanced coverage for forces against weaponized biological agents, and assist CINCs in more effectively visualizing the battlespace. Ships and fixed sites will share a common biological point detector technology with ground forces. The continued fielding of the JSLNBCRS and the addition of the CBMS to all dedicated NBC reconnaissance systems will enhance reconnaissance capabilities.

Combat operations will benefit from automated, networked information system technologies. With the fielding of JWARN, hazards can be more accurately and rapidly

communicated to forces in the affected area. This will help commanders at all echelons visualize the NBC contaminated battlespace, and limit taking protective measures to only those units that will be affected by the hazard. Furthermore, it will enable leaders to minimize degradation by tailoring protective measures to the minimum, based on the predicted local hazards and duration of the hazard. Therefore, casualties are minimized and OPTEMPO is maintained during the NBC attack.

4.6.3 Far-Term

Enhanced situational awareness will improve force readiness by eliminating the unnecessary donning of protective equipment when no hazard is present, and by warning of actual NBC attacks in sufficient time for all personnel to take protective measures. The Services will begin to implement the "sensor-to-warrior" warning network with information transmission being an integral part of the detection system. The transmission of information horizontally across Service lines on an area basis to warn affected units will be seamless. At this point, the CINC will possess a capability for true-mapping and total management of the NBC battlespace.

5.0 Individual Protection Commodity Area

The individual protection commodity area supports the protection tenet of the Joint NBC Defense Concept and the Individual Protection Functional JFOC. Subcategories in this commodity area include general purpose or ground/combat vehicle and aircrew protective masks, general purpose or ground/combat vehicle and aircrew protective suits, and ancillary equipment. The programs are illustrated on the individual protection commodity area roadmap in Figure D-2-1 and D-2-2. The goal is to provide a high level of protection against NBC warfare agents and Toxic Industrial Materials (TIMs), while reducing the physiological burden associated with wearing protective equipment as well as reducing the Total Ownership Costs (TOC) and logistics burden through Joint Service requirements and procurements. This integrated systems approach improves every warrior's survivability by integrating CB defense equipment with other individual equipment to protect against combined environmental effects with minimum mission performance degradation.

Individual Protection Objectives

Mid-Term (FY03-07)

- Improved aviator protective masks
- Improved aviator protective suits
- Decreased degradation due to improved ensemble technologies
- Improved gloves

Far-Term (FY08-17)

- Single general purpose mask system
- Single aviation protective mask system
- Improved performance, integrated CB-protection suits

Research efforts currently emphasize the establishment of more accurate toxicity values and physiological performance criteria for CB warfare agents and TIMs. New barrier and filtration materials and selectively permeable fabrics to accommodate the criteria are being developed and evaluated. Materials that detoxify a broad range of threat agents on contact are being developed and incorporated into fibers, fabrics, and semi-permeable membranes. In

addition, the Services have agreed to common interim mask readiness specifications and are evaluating field data gathered during FY96-98 to develop methods to improve existing mask maintenance and training. The Services plan to develop and field a next generation Joint Service Mask Leakage Tester (JSMLT) to improve field mask readiness. Unique SOF requirements include a low volume, very light weight, one-time use NBC protective suit and respirator. Stockpile surveillance and fielding support efforts are required to ensure user confidence, provide quality assurance feedback, and reduce maintenance costs.

5.1 Technology Base

5.1.1 Protective Masks Technology Base

Mask technology base efforts focus on advanced materials and composites for mask fabrication, improved filter materials, and end-of-service life indicators for filter elements. Improvements will be sought to reduce breathing resistance, increase visual field, expand protection capability (e.g., TIMs), improve comfort, and reduce heat stress to satisfy Joint Service user requirements for both a next generation aviator and ground/combat vehicles forces' masks.

Under the Department of Justice (DOJ) Domestic Preparedness (DP) Program, the National Institute for Standards and Technology (NIST) was charged with the task of developing protective equipment standards for biological and chemical incidents. NIST entered into Interagency Agreements with the National Institute for Occupational Safety and Health (NIOSH) and the DoD Soldier and Biological Chemical Command (SBCCOM) in 4QFY00 for development of respiratory system approval standards. NIOSH has the regulatory authority to develop respirator standards and SBCCOM is supporting the effort by providing the military technical expertise on respirator performance, quality, and reliability standards; and with CWA live agent respirator testing.

A new DTO is pursuing a low-cost, universal end-of-service-life indicator (ESLI) for use in NBC protective mask filters that will indicate the presence of a broad range of CWAs and toxic industrial chemical vapors/gases. The ESLI will enhance safety by alerting the user to replace the filter before its gas-life capacity has expired. It will reduce cost and logistical burden by preventing premature replacement of filters. This DTO addresses a desired requirement for the Joint Service General Purpose Mask (JSGPM). The technology developed may also have application to commercial respirator filters, collective protection filters, and chemical protective clothing. The major JFOC addressed is Individual Protection – Respiration & Percutaneous (IP-RP).

5.1.1.1 Near-Term

In the near-term, mask technology base efforts will focus on improved filtration media and advanced filter bed configurations to address user requirements for reduced breathing resistance, low-profile, NBC, and TIM removal. Efforts will address requirements for the JSGPM, Joint Chemical Environment Survivability Mask (JCESM), and JSAM.

5.1.1.2 Mid-Term

The mid-term focus of mask technology base efforts will be on ESLI to enhance user safety and to reduce the cost and logistics of mask filters; mask/helmet integration concepts to optimize the performance of the mask/helmet system; novel filtration media (both vapor and particulate) to further reduce breathing resistance; advanced mask materials to improve comfort; facilitate sealing to the face; enhance chemical (NBC and TIMs) protection; and to improve compatibility with mission combat equipment. These technologies will be available for transition into the Next Generation General Purpose Mask (NGGPM) and the Next Generation Aviation Mask (NGAM).

5.1.1.3 Far-Term

Far-term mask technology base efforts will investigate the feasibility of non-traditional (non-adsorbent based and/or non-single pass) filtration to meet future operational capabilities.

5.1.2 Protective Clothing Technology Base

Clothing technology base efforts involve developing improved permeable, selectively permeable, catalytically reactive, and/or micro-encapsulating materials. Improvements in areas of aerosol protection, comfort, durability, flame resistance, launderability, weight reduction, bulk reduction, and heat stress reduction continue to be sought to satisfy Joint Service user requirements for next generation chemical protective ensembles including overgarments, undergarments, gloves, socks, overboots, and duty uniforms. These efforts may also yield disposable protective clothing, which offers advantages through reduced costs and logistics burden. Future possibilities also include a Residual Life Indicator (RLI) to monitor the status of protective garments in the field. The major JFOC addressed is Individual Protection – Respiration & Percutaneous (IP-RP).

5.1.2.1 Near-Term

In the near-term, semi-permeable membranes will offer a potential alternative to adsorbent lined protective garments. For the membrane garment to be successful, the user must accept a higher level of encapsulation (better seals) than previous garments. Durability of membrane garments must also be proven to the user. Nanofiber membranes will be investigated as a surface treatment for fielded garments to enhance aerosol protection. These efforts will be available for the Joint Protective AirCrew Ensemble (JPACE) and Joint Service Chemical Environmental Survivability Suit (JSCESS) acquisition programs.

5.1.2.2 Mid-Term

Mid-term efforts will attempt to improve membrane moisture vapor transport through the implantation of ions into the polymer. Reactive materials will be pursued to address the future user requirement of self-decontamination. This technology will be available for the Joint Chemical Ensemble, Blk I.

Individual Protection

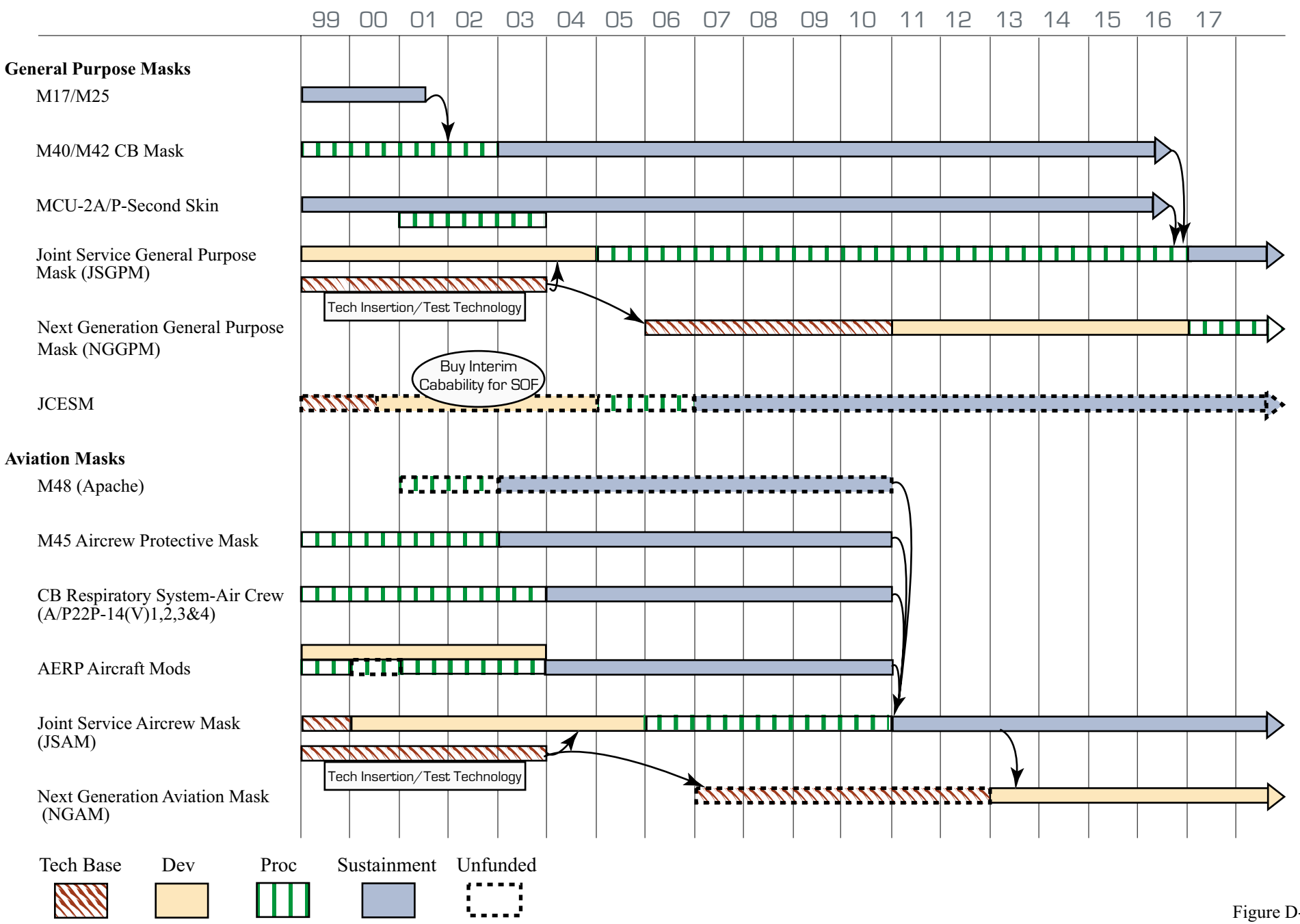


Figure D-2-1

Individual Protection

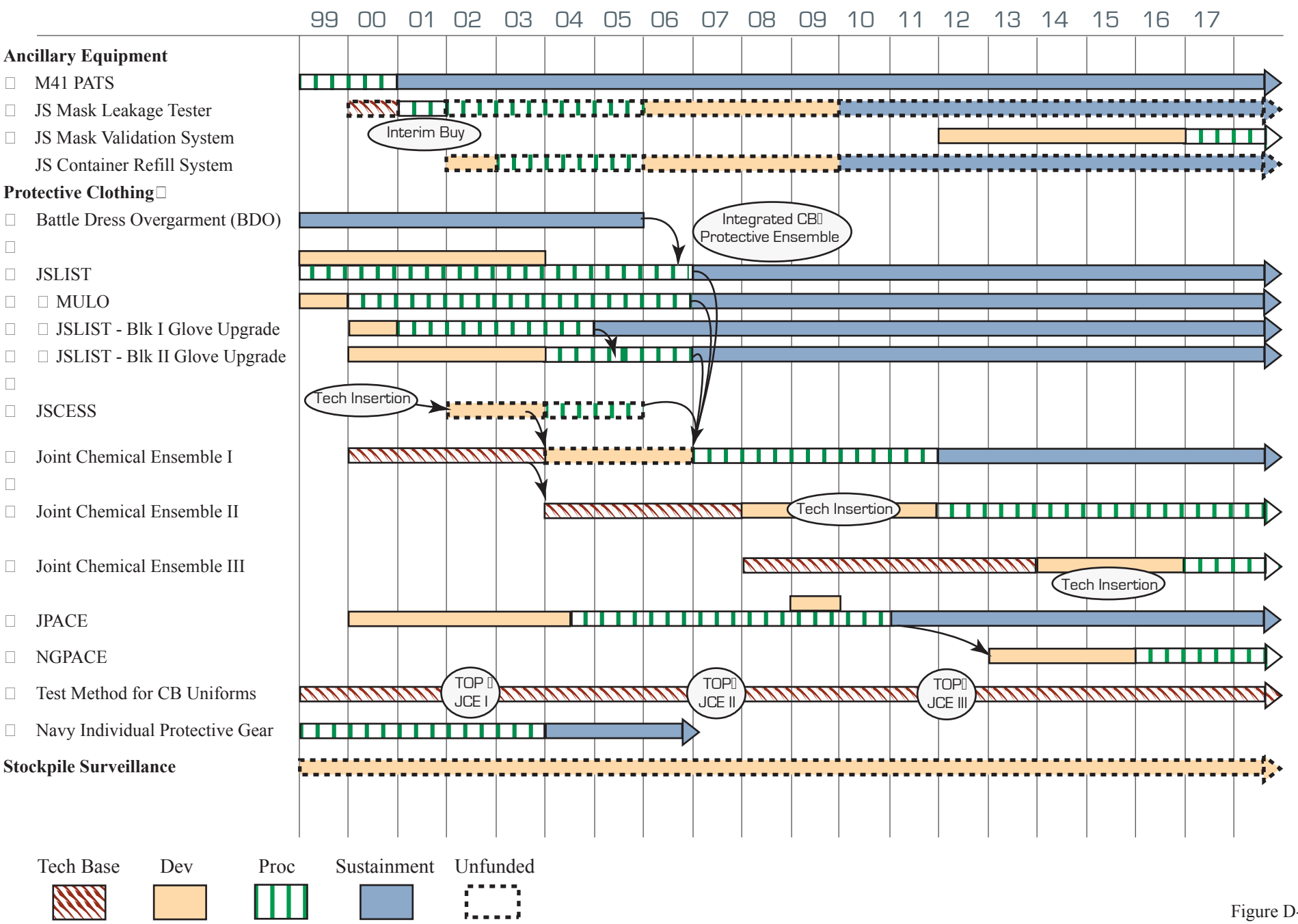


Figure D-2-2

5.1.2.3 Far-Term

Membrane/adsorbent composites will be pursued in the far-term to address the future user requirement of reduced thermal load. Residual life indicators will be investigated to extend the useful life of garments and, thus, reduce logistical considerations and costs. These technologies will be available for the Joint Chemical Ensemble, Blk II and III.

5.2 Protective Masks

5.2.1 Near-Term

Current and Near-Term Systems (FY01-02)

M17/M25 M40/M42
MCU-2A/P M48/M43
M45 AERP
USMC Helo Upgrade (A/P23P-14A(v))
CB Respiratory System (A/P22P-14(V)1,2,3&4)
M41 PATS

In the near-term, the Services will continue to rely on the M40A1/M42A2 (replacing the M17/M25) and MCU-2A/P for ground warriors and sailors. Select Reserve components will possess the M17/25 series protective mask until mid-2001. The M48 is available for the Army's Apache aviators. The Army will continue to field the M45 mask. The Air Force will continue to field the Aircrew Eye/Respiratory Protection (AERP) MBU-19/P system for its aviators. The Marine Corps has fielded a helicopter upgrade (A/P23P-14A(v)) for their rotary wing aviators and the Navy and Marine Corps have initiated fielding of a NDI aviator mask (A/P22P-14(V)1,2,3&4) for all aviators. The M41 Protection Assessment Test System (PATS) provides field units with a rapid and simple method for validating the fit of negative pressure masks to ensure proper fit, thereby enhancing readiness.

5.2.2 Mid-Term

Mid-Term Systems (FY03-07)

JSGPM/JCESM
JSAM
JSCRS
JSMLT

In the mid-term, The JSGPM will be developed. The systems currently in use by the Services cause task and mission performance degradation because of limitations with filtration of TIMs, restricted field of view, impaired communication, and incompatibility with helmet sighting, targeting and data display systems. With sufficient funding, the JSGPM will become the sole respiratory protection system for all ground/combat vehicle warriors and sailors. To respond to SOF requirements and to support other unique mission conditions, a disposable, one size fits all, short duration (6 hours) Joint Chemical Environment Survivability Mask (JCESM) will be developed. Additionally, the Joint Service Container Refill System (JSCRS) will allow refilling of canteens and water distribution in a contaminated environment. The Joint Service Mask Leakage Tester (JSMLT) will allow for the serviceability of components of protective masks to be determined at the small unit level. The JSAM will complete development and initiate production in the mid-term. The JSAM will provide the Services a single protective mask system for fixed and rotary wing aircrew.

5.2.3 Far-Term

Far-Term Systems (FY08-17)

Next Generation General Purpose Mask
Next Generation Aircrew Mask

Improved materials and composites for mask fabrication and improved filter materials will, in the far-term, be incorporated into both the next generation aviator and the ground/combat vehicle forces' masks.

DARPA is funding the Edgewood Chemical Biological Center to screen adsorbents and related air purification materials. This work is directed at developing and characterizing novel adsorbent materials that could be applied to developmental mask filters.

5.3 Protective Clothing

5.3.1 Near-Term

Current and Near-Term Systems (FY01-02)

Battledress Overgarment
Saratoga
MULO
Fishtail Boots
GVO/BVO
JSLIST
7, 14, 25-mil gloves
CWU-66P
JSLIST Blk I Glove Upgrade

To date, approximately 876,444 out of an expected 4,872,333 Joint Service Lightweight Integrated Suit Technology (JSLIST) overgarments have been produced and delivered. Additionally, the JSLIST program developed and is procuring the Multi-purpose Overboot (MULO). The MULO will replace Chemical Protective Footwear Covers and Green/Black Vinyl Overboots. The JSLIST P3I effort entered development in FY97 as a means to insert state-of-the-art CB protection technology addressing all of the desired, but unaddressed requirements for the initial JSLIST program and a SOF ensemble. No candidate materials were found to meet the requirements under this program. Subsequent to this effort, the JSLIST Additional Source Qualification (JASQ), a Congressionally mandated project, was initiated to qualify additional sources of JSLIST materials and to conduct field wear tests and laboratory chemical tests on commercial JSLIST suit candidates. Government and industry are partnering to plan the testing approach. During field wear testing, Marines and sailors will wear JASQ candidate suits while executing mission-oriented, field training scenarios. Field wear testing will last approximately five months, followed by six months of live agent chemical laboratory testing conducted by Dugway Proving Ground (DPG). The JASQ candidates that perform as good as, or better than, the current JSLIST garment will be considered for placement on a JSLIST qualified products list and may be authorized as additional JSLIST material sources.

In addition, the Air Force is leveraging technology from the JSLIST program in the development of a chemical protective firefighter's ensemble. The JSLIST Block I Glove Upgrade (JB1GU) will identify CB protective gloves or glove liners for use with standard ground and aviation duty handwear. It will solicit for COTS or NDI to expedite fielding and will replace the 7, 14, and 25-mil black butyl rubber gloves. The development of a JSLIST Block II Glove Upgrade (JB2GU) is being planned for the mid-term.

5.3.2 Mid-Term

Mid-Term Systems (FY03-07)

JSCESS
JSLIST Blk II Glove Upgrade
JPACE
Joint Chemical Ensemble Blk I

To respond to SOF requirements and support other unique mission conditions, a lightweight, disposable JSCESS will be developed for short-term (6 hours) chemical agent exposure. The JPACE will provide aviators the same advantages and improved protection that JSLIST provides other warfighters. Research and development for JPACE began in FY00, and production is scheduled to begin during the mid-term.

5.3.3 Far-Term

Far-term efforts focus on integrating CB protection into a combat ensemble that combines chemical, biological, flame, infrared, and environmental protection. Reactive and "smart" material technologies will be exploited to improve the warrior's ensemble from a passive to an active protection system.

Far-Term Systems (FY08-17)

Joint Chemical Ensemble Blk II & III
NGPACE

5.4 Operational Impacts

5.4.1 Near-Term

Wearing the current protective ensembles reduces the force's ability to engage the enemy. This, in turn, will reduce friendly force lethality to less than full capabilities. For example, field trials have demonstrated that riflemen may have up to 30% reduction in target accuracy when wearing protective masks. Air sorties and port operations will suffer if attacked by CB agents in the course of operations. The potential exists for all port operations to cease after a persistent agent attack, due to physiological burden of the current individual protective equipment.

The continued fielding of various aviator protective masks in the near-term will significantly benefit our aviators. The M45 provides night vision device compatibility for Army aviators not available with the legacy M24 mask system it replaces. The M48 reduces the protective system weight with improved protection for Apache helicopter pilots, and the A/P22P-14 series provides critical safety and performance enhancements for Navy and Marine Corps aviators.

5.4.2 Mid-Term

For ground/combat vehicle, aircrews, and shipboard use, the currently fielded protective mask systems will provide the required protection through the mid-term until they are replaced with the JSGPM and JSAM. The JCESM will provide a low bulk and weight disposable mask capability for use in special operations in low CB threat environments. The JSMLT will provide an improved capability for units to ensure fielded masks are serviceable and ready for use. The JSCRS will greatly improve the capability and safety in refilling water containers and canteens in a CB environment.

With continued fielding of JSLIST, all Services will benefit from having a common stockpile of protective suits. The Services will be able to cross-level inventory quantities, allowing deploying units to have a full complement of protective suits. This will also enhance the industrial base by allowing manufacturers to rapidly produce suits with common technology and materials for all Services, and should reduce unit cost due to economies of scale.

Improved protective gloves, boots, and lightweight variants of JSLIST will further decrease the physiological and psychological burden of wearing protective clothing. With less degradation, warriors in full mission-oriented protective posture levels can execute combat

operations more efficiently and for greater lengths of time. With lowered degradation, troops retain a greater degree of combat lethality, mobility and survivability.

5.4.3 Far-Term

Operations will be substantially improved in the far-term. Continued fielding of the JSGPM and the JSAM will provide a common stockpile of protective masks for all Services. This will afford deploying units the ability to cross-level inventory quantities. Integrated protective ensembles combine CB protection with ballistic and kinetic energy protection and other features of the Force XXI Land and Air Warrior concepts. Item durability and launderability will lessen re-supply requirements. This will be particularly advantageous for troops on the move or in advanced positions.

6.0 Collective Protection Commodity Area

Collective protection supports the protection and recovery tenets of the Joint CB Defense Concept and the Collective Protection Functional JFOC. The goals for this commodity area are:

- ensure vehicles, vans, and ships have a protected environment that keeps NBC hazards out;
- provide a hazard-free environment for mobile command and control operations;
- provide a hazard-free environment for long-term command and control operations;
- provide a hazard-free environment for forward tactical medical operations, and;
- provide a hazard-free environment for long-term rear-area medical operations.

Collective Protection Objectives

Mid-Term (FY03-07)

- Increased number of shelters for command/control, medical, and rest/relief areas
- Rapid insertion of technology improvements to existing equipment
- Improved shipboard systems
- Begin fielding of new technology shelter system

Far-Term (FY08-17)

- Full integration of collective protection into standard shelter systems
- Standardization of equipment
- Fielding of technology improvements
- Fielding of novel filtration technologies

Collective protection provides a rest and relief area for warfighters who must operate for extended periods at full protective posture. Lightweight systems with integrated environmental control and power generation capabilities are being developed for integration into a number of host systems. The Navy now includes collective protection systems on all new construction ships. Mid- and far-term technology objectives seek to improve affordability and deployability by reducing system weight, size, logistics, and assembly time. Improvements to carbon and High Efficiency Particulate Arresting (HEPA) media and regenerative filtration materials and techniques will be developed and fielded to reduce maintenance and logistical burdens. Procurement of ground force shelters will be accomplished as funding becomes available. Relying on the proponents for major acquisition systems to procure and integrate specific collective protection equipment could result in both an uneven capability among units in the field and an unstable R&D base. The collective protection

commodity area roadmap includes advanced shelter, filtration, and ship system technologies (Figure D-3-1).

6.1 Technology Base

The collective protection technology base focuses on technologies that will provide improved filtration and shelter systems (e.g., enhanced protection with lower investment of power, space, weight, cost, and logistics). Specific areas of activity in the filtration area include: advanced adsorbent materials and filter design that will replace or enhance the performance of currently available activated carbon systems; development of a miniature residual-life indicator to indicate impending loss of filtration performance; regenerative filtration technologies including pressure- and temperature-swing adsorption; filter bed immobilization technology to reduce filter attrition and weight while maintaining performance; development of novel filter designs to address threats from toxic industrial chemicals; and fundamental (6.1) studies of equilibrium properties of novel adsorbent materials and filtration dynamics.

The filtration development efforts all contain an element of empiricism owing to the highly complex nature of the filtration process. However, several of the efforts, (e.g., regenerative filtration and fundamental studies), are accompanied by a significant modeling effort that will develop our understanding of the interrelationships and relative importance among the governing macroscopic (system) and microscopic (fundamental) properties. A significant portion of the filter technology work is also relevant to individual protection applications.

Improved shelter system technologies include advanced shelter fabric materials and advanced shelter system concepts to include rapid deployment, enhanced modularity and interfaces, and lower logistical burden of weight and cube. As collective protection technologies mature, they will be incorporated into developmental systems as well as existing systems.

DTO, CB.08, Advanced Adsorbents for Protection Applications, is underway to improve understanding of the relationship between physical and chemical properties of vapor filtration media and their CWA protection performance in filtration devices and to develop novel filtration materials and designs to improve existing applications and optimize future systems. The effort will screen commercial and developmental adsorbent materials for filtration performance capabilities and develop performance models to better understand the relationships between adsorbent properties and filtration performance, identify advanced filter bed designs to address specific filtration applications, and transition filter designs to focused development programs. The major JFOCs addressed are Collective Protection – Mobile Applications (CP-MA) and Collective Protection – Fixed Site Applications (CP-FS).

In FY01, a Front End Analysis of the collective protection technology base program will be completed to ensure the technology base program is responsive to user needs, as delineated in the approved NBC Defense JFOCs to take advantage of significant commercially available technology to leverage DoD funding.

Collective Protection

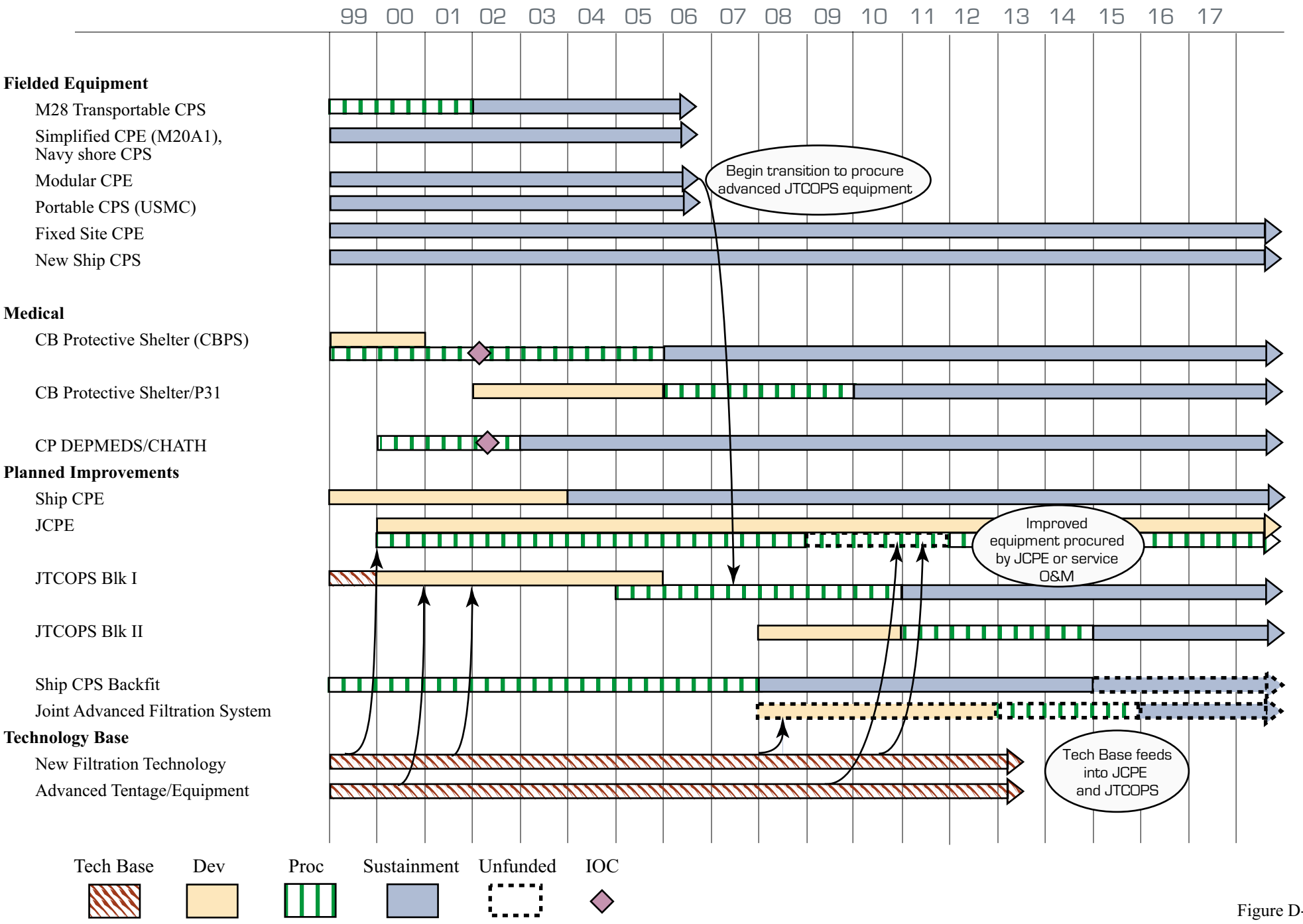


Figure D-3-1

6.1.1 Near-Term

The near-term focus of collective protection technology base efforts will be on improved filtration media and advanced filter bed configurations to address user requirements of enhanced protection and reduced flow resistance. Advanced materials and seals will be pursued to reduce the weight/cube/cost of portable shelters while improving the protection provided. Efforts will address requirements of the Future Scout and Cavalry System (FSCS), Future Combat System (FCS), Joint Collective Protection Equipment (JCPE) program, and Joint Transportable Collective Protection Shelter (JTCOPS) Blk I.

6.1.2 Mid-Term

The mid-term focus of collective protection technology base efforts will be to provide protection against a wider spectrum of threats (NBC/TIMs) for a longer period of time. This will be accomplished primarily through advanced adsorbents, novel bed designs, and regenerative filtration systems. Collective protection filter residual life indicators will extend the operational life of filters thus improving safety and reducing costs and logistical burden. Technologies will also be pursued for reducing the logistics associated with establishing a collective protection facility. These technologies will be available for transition to the JCPE program and JTCOPS Blk II.

6.1.3 Far-Term

Far-term collective protection technology base efforts will investigate the feasibility of non-traditional (non-adsorbent based and/or non-single pass) filtration to meet user collective protection needs as defined in the approved NBC Defense JFOCs. Materials will be sought for portable shelters that meet the general requirements of performance and cost for universal shelters while providing NBC protection. These technologies will be applicable to future collective protection systems.

6.2 Collective Protection Systems

6.2.1 Near-Term

Near-term objectives involve two main items: 1) increasing the number of collectively protected shelters and platforms in command/control, medical, and rest/relief areas, and 2) using new technologies to make incremental improvements in currently fielded collective protection equipment.

Current and Near-Term Systems (FY01-02)

M28 CPE
Simplified CPE
Modular CPE
PCPS (USMC)
Fixed Site CPE
CBPS
CP DEPMEDS/CHATH
Ship CPE
JCPE
PACAF CPS

Several procurement programs are in place to increase the number of collectively protected shelters and platforms. The M28 CPE is a highly transportable inflatable collective protection shelter system used in conjunction with the TEMPER (Tent Extendable Modular Personnel) for medical or command post missions so personnel can perform their duties unencumbered by individual protective equipment.

For medical facilities, the Chemical Biological Protective Shelter (CBPS), Collective Protection kits for the Deployable Medical System (CP DEPMEDS), the Chemically Hardened Air Transportable Hospital (CHATH), and Ship Collective Protection System backfit equipment are being procured. The CBPS is the primary shelter for ground-based tactical medical units where high mobility and rapid deployability are major requirements. The CBPS replaces the obsolete M51 Shelter System. CP DEPMEDS and CHATH provide collective protection backfit "kits" to enable field hospitals to operate in contaminated environments. The Ship CPS backfit program provides collective protection to the Command and Control and hospital areas on large-deck amphibious ships, and includes the capability to treat contaminated casualties arriving from the shore.

Improvements to currently fielded equipment are the second near-term goal. The JCPE program provides needed improvements and cost-saving standardization to currently fielded equipment in all Services. JCPE also provides the means to rapidly insert advanced filter and equipment technologies into the field as they become available.

Ongoing JCPE improvements include improved particulate filtration, improved vapor filtration, rapid purge airlocks, fixed installation filter improvements, recirculation filter improvements, increased filter service life, and lightweight environmental control units (ECUs) and motor blower units to replace older fielded units. The Ship CPE program provides needed improvements to ship-specific collective protection systems, and will transition to the JCPE program in FY03.

6.2.2 Mid-Term

Mid-Term Systems (FY03-07)

CBPS P3I
JCPE
JTCOPS Blk I

Mid-term objectives also focus on increasing the number of collectively protected shelters listed above, continuous incremental improvements through the JCPE program, the fielding of a new technology shelter system called the Joint Transportable Collective Protection Shelter (JTCOPS) and CBPS P3I. JTCOPS Blk I will harden selected fielded shelters using new technology, and will begin procurement in FY05.

The CBPS P3I will improve logistics supportability, power efficiency, and reduce system weight. The CBPS P3I will include development of mobile versions of CBPS on platforms suitable for forward deployed medical units within airborne/air assault and heavy divisions. This will provide a capability to these units to be able to deliver adequate medical care in a contaminated environment

6.2.3 Far-Term

Far-Term Systems (FY08-17)

JTCOPS Blk II
Joint Advanced Filtration System

The far-term objective is to make collective protection transparent to the warfighter by providing integrated collective protection to all Service platforms. The JTCOPS Blk II program will use new technologies to provide an advanced, lightweight, highly transportable shelter system that all Services will use. This new shelter system will

replace all existing shelter systems as they become obsolete.

Additional far-term objectives are to standardize collective protection equipment across the Services to further ease cost and logistics burdens, continue making incremental improvements to fielded equipment by quickly inserting new technologies as they become available, and to further develop and field novel filtration technologies.

The Joint Advanced Filtration System will incorporate new filtration technology to increase filter capacity and performance while reducing cost, logistical burden, power, and weight requirements. Protection capabilities will be expanded to include TICs, TIMs, and FGAs in the far-term.

6.3 Operational Impacts

6.3.1 Near-Term

Personnel operating inside combat vehicles, command posts, and other vehicles protected by integrated collective protection systems will experience only minimal OPTEMPO degradation. Similarly, many ships will be partially protected in compartmented areas where the use of protective ensembles would be particularly degrading (e.g., command and control spaces, pilot ready rooms, and medical facilities). The JCPE will consolidate Service requirements for temporary shelters and provide enhanced protection for theater rear area assets.

Rear areas will have collective protection systems largely limited to medical facilities. Therefore, support operations during combat will be significantly slowed. While the cumulative effects of this degradation will *not* cause U.S. forces to lose the conflict, the effects may increase U.S. casualties through protracted fighting and degraded combat lethality. The effects may also impact sortie generation.

6.3.2 Mid-Term

Improved integrated collective protection systems will benefit the crews of combat vehicles and ships by eliminating the need to wear protective ensembles and by partially reducing maintenance and logistics support requirements. Theater rear area operations will not be significantly improved over the mid-term.

6.3.3 Far-Term

Improved collective protection systems will be networked and will automatically initiate to protect troops upon detection of CB agents. As a whole, the family of collective protection systems will reduce the necessary resources to reconstitute warfighting assets by limiting initial contamination.

7.0 Decontamination Commodity Area

The decontamination commodity area supports the protection and restoration tenets of the Joint NBC Defense Concept and the Restoration Capability Functional JFOC. The goals for this commodity area are to secure technology that removes and detoxifies contaminants from materiel without performance degradation, inflicting injury to personnel or damage to the equipment or environment, and to reduce the logistical burden of current decontamination procedures.

Decontamination Objectives

Mid-Term (FY03-07)
- Sensitive Equipment Decon
- Joint Service Fixed Site Decon
- Superior Decon System

Far-Term (FY08-17)
- Aircraft and other vehicle interior decontamination
- Lightweight Portable Decon System
- Next Generation Decon Kit

Materials research is complemented by the development of contamination control techniques that minimize the extent of contamination pickup and transfer, and maximize the ability of units to perform decontamination operations, both on-the-move and at fixed sites. Near-term and mid-term efforts focus on development of a family of decontaminants and application devices for use on combat equipment, as well as decontaminants for personal gear and skin. The programs are illustrated on the decontamination commodity area roadmap in Figure D-4-1.

7.1 Technology Base

The decontamination program area currently divides its technology base research efforts into four major thrust areas; sensitive equipment, solution chemistry, enzyme reactants and solid phase approaches. A variety of decontamination technologies are currently being pursued in each of these areas to meet the mid-term and far-term objectives of the decontamination program. In addition to these technology initiatives, several studies of a supporting nature are also occurring that are necessary to answer fundamental questions associated with the fate of chemical or biological agents and their impact on decontamination and the restoration of operations.

7.1.1 Sensitive Equipment Decontamination

The first thrust area is sensitive equipment decontamination. This area subdivides into three major areas necessitating different approaches. The first phase of this program is the decontamination of small equipment items, parts, or components that may be easily damaged by current decontamination methods and is the first mid-term objective of this program. Phase II of this project is actually a far-term objective and focuses on decontamination of interior spaces such as the interior of aircraft, ships, vehicles, and mobile communication stations, all of which contain a multitude of surfaces and electronic components. In Phase III, the users have requested the capability to perform decontamination of these interiors while on the move.

Decontamination

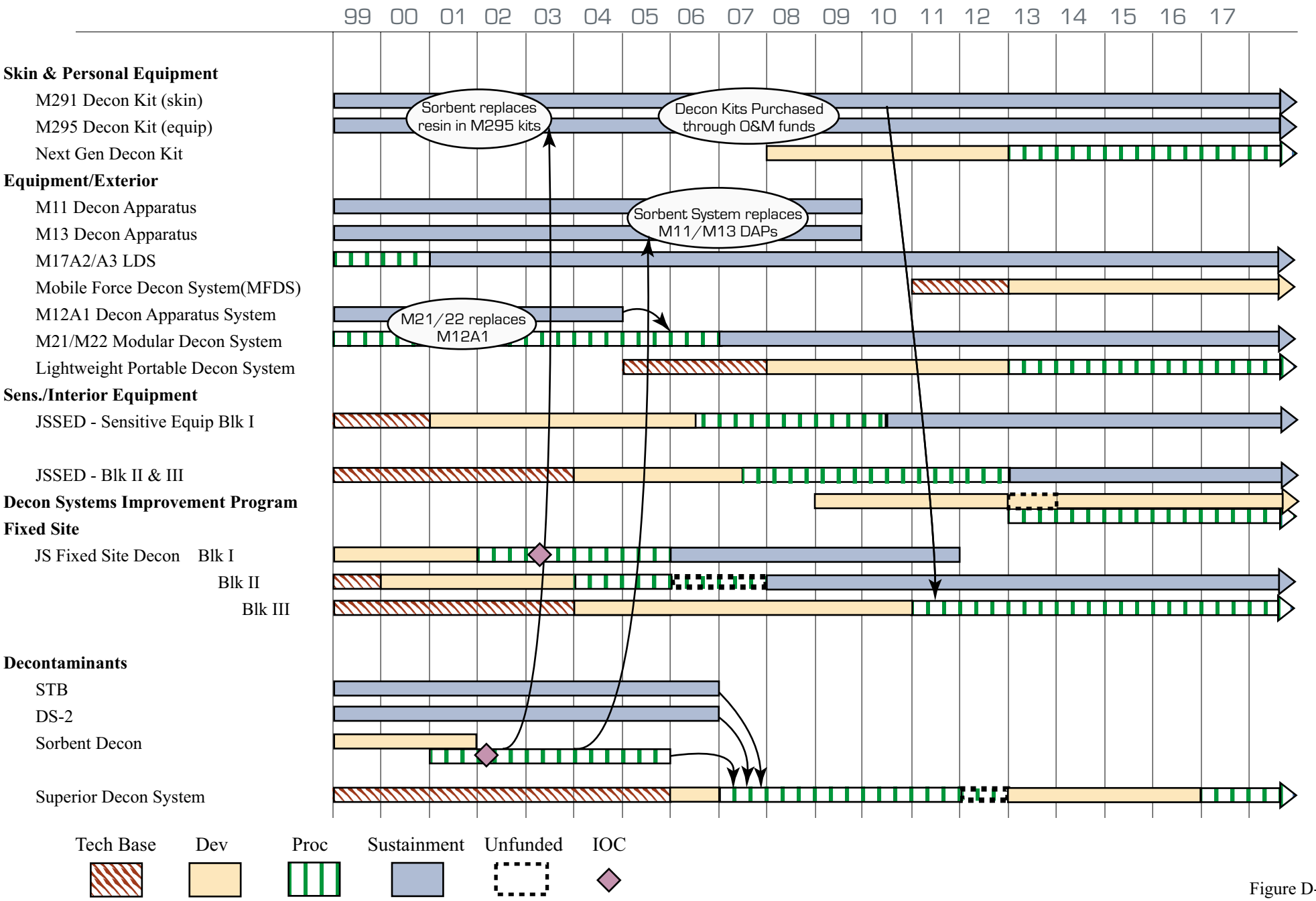


Figure D-4-1

Over the last several years the technology base program reviewed several potential technologies to address Phase I of this thrust area. These include a solvent wash system using non-ozone depleting solvents, supercritical carbon dioxide ($SCCO_2$), ozone, and atmospheric plasma. The solvent wash system and $SCCO_2$ appear to be the top candidates coming out of the first phase of this project.

For Phases II and III, a number of approaches have been investigated and it was determined that gaseous reactants yield unacceptable results including toxic by-products, incomplete reactions, and potential fire hazards with on-board filtration materials and systems. Plasma-based technology for spot decontamination performed somewhat better; however, after identifying sufficient technical challenges the CB Technology Area Review and Assessment (TARA) panel determined that this approach was not suitable. Alternative approaches based on thermal approaches and solvent wash technologies are currently being formulated. The major JFOC addressed is Restore – Equipment/Facilities/Large Areas (RC-EL).

7.1.2 Solution Chemistry

The second thrust area of the decontamination technology base program is solution chemistry. This thrust supports mid-term objectives to find alternative methods or materials that can be used to replace existing fielded decontaminants. These will provide a decontamination ability for fixed facilities, such as Aerial Ports of Debarkation (APOD), Seaports of Debarkation (SPOD), and logistic sites, as well as for on the move requirements for mobile forces.

The overall goal of this thrust area is to develop a solution-based decontamination system that is non-toxic, non-corrosive and environmentally safe. In addition, the new decontaminant must be extremely reactive with a residence time of under 15 minutes and be effective at a pH below 10.5. Since these requirements eliminate the use of chlorine bleach solutions, alternative solution approaches must be developed.

Potential new solutions-based approaches consist of both organic and aqueous systems using catalytic and oxidative chemistries. Some promising organic decontaminants under consideration are monoethanolamine-type moieties, dioxiranes, and liquid slurries or suspensions of nanoparticles in organic solvents. Potential aqueous decontaminants also exist, including two peroxy-based methods. Peroxycarbonates look promising when incorporated in aqueous or aqueous/mixed organic media and percarboxylic acids appear effective in microemulsions and surfactants. The major JFOCs addressed are Restore – Equipment/Facilities/Large Areas (RC-EL) and Restore – Logistics (RC-LG).

7.1.3 Enzyme Reactants

Although technically a solutions approach, enzymes form the third major thrust area for the decontamination technology base research program and support the mid-term decontaminant replacement objectives discussed under sub-heading 7.1.2. Several initiatives are occurring in the enzyme area including increased efforts under DTO CB.09.12. The objective of this DTO is the development of an enzyme-based, catalytic decontaminant that will also be non-toxic, non-corrosive, and environmentally safe. The decontaminant, which will consist of a variety of

enzymes, chemical catalysts or reactants, and stabilizing materials, will be packaged in a dried form and easily reconstituted with water when needed. In addition, several developmental studies are also in progress to support the enhancement of the enzyme-based decontaminant system. These include various recombinant DNA technology-based efforts designed to improve the reactivity of the enzymes and expand their host ranges.

7.1.4 Solid Phase Approaches

The final thrust of the decontamination technology base program is a solid phase approach. One portion of this program looks at the mid-term program objective of replacement sorbents for the M295 kits. This effort goes beyond that of current sorbent technology. It looks at methods of enhancing the sorbent blend to enable it to destroy both chemical and biological agents once absorbed.

Also loosely tied to the solid phase thrust area is the advanced coatings initiative. This area is still in its very early stages and is considered a far-term objective. Work in this area will concentrate on the initial review of potential technologies, the assessment of whether sufficient technologies exist to support this effort, and whether this effort is appropriate for the decontamination program. The ultimate goal of this effort is to develop a chemically or possibly electrically reactive coating to apply on equipment prior to CB attack. This coating would provide immediate decon on contact, reducing the hazard without any actions required at that time by the warfighter. The major JFOC addressed is Restore – Equipment/Facilities/Large Areas (RC-EL).

7.1.5 Supporting Studies

Although not specifically designated as a thrust area at this time, the decontamination technology base program's supporting studies area is investigating several issues impacting the entire decon program. Several mid-term studies looking at chemical agent fate on a variety of surfaces such as concrete and asphalt will yield important data necessary to determine the requirement for decontamination of these materials in a restoration of operations scenario.

In addition, a far-term study addressing reaerosolization of bacterial spores will also help determine if biological decontamination is necessary for areas with residual biocontamination and will also give some indication of potential downwind hazards associated with these areas. This study will require a great deal of modeling and simulation support and is expected to cross commodity areas.

7.1.6 OGA Coordination

Finally, the decontamination technology base program has increased its contact with other government agencies also involved in the area of decontamination. Some of the OGA initiatives taking place in the area include:

- The Sandia National Laboratory (SNL) is continuing development of a foam-based oxidant/additive system.

- The LLNL is continuing development of reactive gels containing oxidants to dissolve and detoxify CB agents.
- The Los Alamos National Labortary (LANL) is continuing development of the Atmospheric Pressure Plasma Jet (APPJ) for use in sensitive equipment decontamination.
- The transition of DARPA sponsored projects to the technology base research program.

Technologies from SNL, LLNL, and DARPA are among technologies being evaluated in either or both the Joint Service Fixed Site Decontamination (JSFXD) program and the Restoration of Operations (RestOps) Advanced Concept Technology Demonstration (ACTD).

7.2 Decontamination Systems

7.2.1 Near-Term

Current and Near-Term Systems (FY01-02)

M291 Decon Kit
M295 Decon Kit
M11 Decon App
M13 Decon App
M17A2/A3 LDS
M12A1 Decon App Sys
M21/M22 Mod Decon System

In the near-term, fielding was initiated for the M21/M22 Modular Decontamination System (MDS). The MDS is primarily replacing the aging M12A1 Power-Driven Decontamination Apparatus (originally fielded in the 1960s) and the M17A3 Lightweight Decontamination Apparatus in Army chemical units. The current M17 Lightweight Decontamination System (LDS) requires gasoline, which is a logistical burden during a conflict. The Marine Corps is on contract to procure a heavy fuel engine that operates on Jet Propellant 5 (JP-5) and Jet Propellant 8 (JP-8) and will eliminate the need for mixing oil and the need for gasoline. Additionally, the M291 and M295 decontamination kits replaced the M258A1 decontamination kits for all Services.

7.2.2 Mid-Term

Mid-Term Systems (FY03-07)

JSSED Blk I
JSFXD Blk II

The mid-term efforts will also be directed toward dedicated fixed site decontamination systems for Joint Service applications, such as Joint Service Fixed Site Decontamination (JSFXD). Efforts to develop a capability to fully decontaminate sensitive equipment (e.g., avionics, electronics, rubber, etc.) will be pursued in the Joint Service Sensitive Equipment Decontamination (JSSED) System. The Marine Corps will be testing the reliability of the heavy fuel engine that operates on JP-5 and JP-8, eliminates the need to mix 2-cycle oil and fuel, and requires less fuel to operate. The modified engine may be adopted as one of the applicators for the JSFXD program.

7.2.3 Far-Term

Far-Term Systems (FY08-17)

Next Gen Decon Kit
Lightweight Portable Decon System
JSSED Blk II/III
JSFXD Blk III

Aircraft and vehicle interior decontamination requirements will be addressed in the far-term as a block upgrade to the JSSED program. New decontaminants will be integrated into the Next Generation Decontamination Kit, which will replace the M291 and M295 kits beginning in FY13. The JSFXD Blk III will focus on medical decontamination.

7.3 Decontaminants

7.3.1 Near-Term

The JSFXD program will develop a "family of decontaminants" to address the requirements for ports, airfields, and logistics centers. These decontaminants will take advantage of logistic capabilities offered at fixed sites, such as storage facilities, availability of dispersing systems not dedicated for decontamination operations, and available water and fuel.

Current and Near-Term Systems (FY01-02)

STB
DS-2
SORBDECON
JSFXD Blk I

The sorbent decontamination system (SORBDECON) will be fielded in the near-term and will replace both the M11 and M13 Decontamination Apparatuses. Fielding of the sorbent decontamination system is an important step in meeting the CINC requirements for maintaining OPTEMPO while indirectly enhancing equipment survivability and will allow troops to perform immediate decontamination of equipment.

7.3.2 Mid-Term

In the mid-term, SORBDECON is also a candidate to replace the XE555 decontaminant in the M295 Decontamination Kit. Incorporation into the M295 Kit is scheduled for FY03 and will be accomplished by an engineering change proposal. Sorbent procurement funding is typically budgeted within the costs of the apparatuses and kits. A tailored sorbent decontamination system is of special interest to the Special Operations Force, whose missions do not allow for a water-based system.

Mid-Term Systems (FY03-07)

Superior Decon System

Fielding of a Superior Decontamination System is planned to begin in FY07. This solution is to be less toxic than current decontaminants and useable by future application systems to provide a safe, effective decontamination capability to our forces. Additionally, there is interest and research in coatings that may reduce or eliminate the necessity of manual decontamination.

7.4 Operational Impacts

7.4.1 Near-Term

Theater reconstitution operations will rely on centralized decontamination units, but not all equipment will be immediately recoverable. The M21/M22 MDS will bring systems back to full operational effectiveness. Water-based, corrosive decontaminants will damage avionics, electronics, rubber, plastics, and other materials used in weapon systems. These systems must rely on weathering and time to become safe to handle after decontamination. While systems are weathering, personnel must continue to wear the protective ensemble, thereby degrading their performance and availability to perform duties.

7.4.2 Mid-Term

Ports, airfields and logistics centers will have a higher logistics throughput capability resulting from procurement of the JSFXD. Decontamination actions will be accelerated. The use of sorbents during decentralized operations will allow contact hazards to be removed from a large variety of equipment. These operations will neither require heavy use of water-based decontaminants, nor demand excessive time and dedicated personnel to complete decontamination. Airbases and ports will have a higher readiness status resulting from development and procurement of a rapid decontamination capability for critical large area fixed-sites.

7.4.3 Far-Term

Medical decontamination will be possible with the procurement of the JSFXD Blk III. Contaminated patients can be treated immediately for both their wounds and contamination effects. With enhanced sensitive equipment decontamination, vehicles and aircraft can be returned more easily to the battlefield.

8.0 Medical Systems Commodity Area

Medical NBC Defense systems support the protection and restoration tenets of the Joint NBC Defense Concept and several major JFOCs (IP-MP Medical Prophylaxes, RC-TR Medical Treatment, RC-MD Medical Diagnostics, CA-MV Medical Surveillance/Veterinary Support NBC). Subcategories in this area include medical chemical defense (pretreatments, treatments and diagnostics), medical biological defense (vaccines/prophylaxes, therapeutics and diagnostics), and medical radiological defense with a focus on the development of prevention, assessment and treatment modalities. The programs illustrated on the medical systems commodity area roadmaps, Figure D-5-1 through D-5-4, will be integrated into a seamless system that supports the CINCs and preserves combat effectiveness through timely application of medical countermeasures against chemical/biological agents and radiation injury.

The goals of the medical NBC Defense research program are to: (1) provide individuals and medics with medical pretreatments for exposure to CW agents; (2) provide individuals and medics with post treatments for CW agents; (3) provide individuals with medical vaccines prior to exposure to BW; and (4) develop medical identification and diagnosis device capable of identifying multiple BW agents in clinical and environmental sources.

The objectives within the medical chemical defense research program address new or improved pretreatments, therapeutics, and diagnostics to protect the warfighter from exposure to CWAs. Agent specific objectives include: the development of a pretreatment that prevents injury from vesicant exposure or the development of a treatment to reduce the effects of vesicant exposure (e.g., interrupting the blister formation cascade process); the fielding of an improved anticonvulsant antidote to quickly stop nerve agent-induced seizures and reduce recurrence; the development of an effective pretreatment to nerve agent exposure based on biological scavenger molecules, such as the enzyme butyrylcholinesterase (BuChE), and the development of effective pretreatments and therapies for blood and respiratory agents.

The medical biological defense program technology base focuses on technological approaches to medical countermeasures against biological agents that the intelligence community validates to be the most likely threats to U.S. forces. The advanced development programs focus on the development and licensure of products to meet validated operational requirements. Overall medical biological defense program objectives include the development, FDA licensure, and production of baseline stockpiles of prophylaxes (vaccines and pre-treatments), therapeutics (antibiotics, antivirals, antitoxins, and antibodies), and the development of FDA-approved medical diagnostic capabilities and systems (e.g., reference laboratory, field laboratory, and rapid, portable diagnostic tests for use in the field).

The objectives of the medical radiological defense program technology base are to: (1) continue to develop radioprotectants that provide a measure of protection against both acute injury and long-term health effects of radiation without compromising tactical efficiency; (2) develop biological radiation assessment systems that can accurately and rapidly determine the individual's radiation exposure dose; (3) develop therapeutic strategies for the acute, delayed, and chronic effects of radiation exposure alone and in combination with biological and chemical agents, and (4) develop assessment and treatment techniques for internal contamination by depleted uranium (DU) and other radioactive heavy metals. Under public law, funding for the medical radiological program is not part of the Medical Chemical Biological Defense Research Program and, therefore, is not shown in Appendix G. Medical radiological research is conducted by the Armed Forces Radiobiology Research Institute, which is under the Uniformed Services University of Health Sciences, or may be externally funded by a specific Service or another government agency.

To obtain Food and Drug Administration (FDA) licensure of medical products, there is a requirement to demonstrate the efficacy of the intended product in humans against the disease or condition of interest. For medical NBC Defense products, this is problematic, since it is difficult to find natural occurrences of diseases caused by biological, chemical, or radiological threats. It is also untenable to intentionally expose human subjects to NBC threats to demonstrate efficacy. Additionally, it is not likely that, in the natural setting, the threat would be presented by the same means that would likely be applied in a battlefield scenario (e.g., aerosolization of biological agents). The need to demonstrate efficacy and obtain FDA licensure presents unique challenges in fielding chemical, biological, and radiological defense prophylaxes and treatments. The FDA has published a proposed rule that would permit certain animal studies in support of a demonstration of efficacy of a product. However, no products have yet been licensed under this proposed rule. Therefore, the medical systems roadmaps are estimates of the time required to reach procurement and fielding.

8.1 Technology Base

8.1.1 Medical Chemical Defense

Technology base efforts for medical chemical defense are focused on identifying, evaluating, and developing technological approaches for protecting the warfighter from injury or death if exposed to CWAs and include: identification of pathophysiological mechanisms

involved in toxic processes; development and evaluation of products to prevent or counter the effects of CW agents; development of assays and equipment for diagnosing CWA exposure; and development of methods to measure effectiveness in animal models that are predictive of the human response. Medical chemical defense technology base efforts may be equated with technology development and technology demonstrations. Technology development in medical chemical defense encompasses basic research, applied research, and concept exploration and is directed toward the development of medical countermeasures for chemical threat agents. Typical activities include:

- defining animal models,
- determining mechanism of action,
- evaluating novel hypotheses/technologies (pretreatments, therapeutics, and diagnostics),
- screening for potential candidates,
- determining safety and effectiveness,
- developing assays and reagents for identification and quantitation of the candidates in blood or tissue, and
- establishing surrogate endpoints for use in clinical efficacy studies.

Technology development efforts are arranged according to the medical categories of pretreatment, therapeutics, and diagnostics. Within these broad categories, research efforts are distributed in accordance with the impact on operations, the potential contribution of new technology to overcoming each threat, and the feasibility of achieving the technology objectives through military investment.

Technology demonstrations in both the medical chemical and biological defense research programs are concepts or technologies determined to be mature enough to transition a candidate pretreatment, therapeutic, or diagnostic to advanced development within a three to five year timeframe. Assessment of these technologies via Scientific Steering Committees and other stakeholders leads to the selection, development, and submittal of DTOs to a CB defense panel. Upon approval of the submissions, DTOs are externally reviewed on an annual basis. Currently there are three medical chemical defense DTOs that focus on the development of medical countermeasures: (therapeutic) against vesicants injury (blisters), development of a chemical agent prophylactic (pretreatment), and development of a reactive component for inclusion in the Skin Exposure Reduction Paste Against Chemical Warfare Agents (SERPACWA (pretreatment)). The specific titles and text of the medical chemical defense program DTOs are found in Appendix F. These efforts support future goals of improved topical skin protectants, skin injury treatments, cyanide pretreatments, phosgene therapeutics, wound decontaminants, anticonvulsants, other neuroprotectants, nerve agent prophylaxes, therapeutics, and antidotes.

8.1.2 Medical Biological Defense

Technology base efforts for medical biological defense are focused on identifying, evaluating, and developing technological approaches for protecting the warfighter from injury or death if exposed to biological warfare agents. Given the wide range of validated BW agents, the goal is to broaden the range of effective pre- and post-exposure medical countermeasures and

medical diagnostic capabilities currently available to the Services. Technology base efforts for medical biological defense focus on:

- identification of mechanisms involved in the disease process (e.g., pathophysiology) and development of an understanding of the generation and control of the immune response,
- development and evaluation of prophylactics (vaccine and pretreatment candidates) and therapeutic concepts and technologies,
- development of methods to measure the effectiveness of products in animal models which are predictive of the human response, and
- development and evaluation of diagnostic technologies and systems.

As in medical chemical defense, medical biological defense technology base efforts are equivalent to technology development and technology demonstrations. Technology development encompasses basic research, applied research, and concept exploration, and is directed toward the development of medical countermeasures for the validated biological threat agents. Activities include defining animal models, determining mechanisms of action, evaluating novel hypotheses/technologies (vaccines/pretreatments, therapeutics, and diagnostics), screening for potential candidates, determining safety and effectiveness, developing assays and reagents for identification and quantitation of the candidates in blood or tissue, and establishing surrogate endpoints for use in clinical efficacy studies. Medical biological defense technology development efforts are arrayed into the following functional areas:

- Bacterial vaccines
- Bacterial therapeutics
- Toxin vaccines
- Toxin therapeutics
- Viral vaccines
- Viral therapeutics
- Diagnostic technologies

Technology demonstrations in medical biological defense research programs are managed in the same way as described for the medical chemical defense research programs in the preceding section. The Medical Biological Defense Program currently manages eight DTOs. These efforts are focused on the development of medical countermeasures (vaccines and/or therapeutics) against bacterial threats (anthrax, plague, and Brucellae spp.), viral threats (VEE, EEE, WEE, orthopox viruses, and filoviruses), and toxin threats (staphylococcal enterotoxins and botulinum). Additionally, there are ongoing DTO efforts directed toward a common diagnostic system for the identification of BW threats and endemic infectious disease, and a multiagent vaccine capable of providing protection against at least three BW threats in a single vaccine. The specific titles and text of the current medical biological defense program DTOs are found in Appendix F.

Technology base efforts for medical radiological defense focus on identification of the pathophysiological mechanisms of injury by radiogenic materiel and its ionizing radiation-induced injury, molecular and cellular level injury mechanisms, and development of countermeasures, including radioprotectants and therapeutic modalities. Measurements of

biological damage mechanisms are yielding advanced biological dosimetry procedures and techniques. Early research in nuclear exposure, combined with chemical or biological agents, indicates significant chemical, biological, and radiation interactions. Research into these modalities, to include novel drug administration techniques for both pre-exposure and post-exposure regimens, will continue.

Science and technology initiatives compete for funding within the appropriate program elements of the Joint CBDP and the DARPA biological defense program on the basis of technical merit and the anticipated ability of the technology or system to meet Joint and Service unique needs. There are ongoing efforts within the CBDP to transition medical technologies developed in the DARPA program to the medical biological technology base for exploitation and further development. During FY00, a technology base review of DARPA-funded programs led to down selection of three programs for transition. Medical product candidates will be developed in support of Medical Biological Defense Research Program efforts. The selections focus on:

- The development of broad-spectrum vaccines by molecular breeding (gene shuffling) strategies based on demonstrated success in a hepatitis B surface antigen model. This effort will be focused on development of vaccines with broad cross-protection for the alphaviruses (equine encephalitis viruses).
- Broad-spectrum antimicrobial drug discovery efforts. This technology involves development of RNA binding compounds that focus on highly conserved RNA structures in pathogens. The program will be focused either on therapeutics for RNA virus threats or for antibacterial targets.
- High-level plant-based expression system for vaccine antigens and epithelial transport molecules (IgA secretory) for biological threat agents. Complete human antibodies produced in plant materials (plantibodies) demonstrated neutralization against viral target (herpes simplex virus). Vaccine production costs in transformed monocot (grain) tissues yield tremendous potential advantage over current production methods.

The medical biological defense programs planned for transition to Phase 0 (Concept Evaluation) in FY01 include:

- Next Generation Anthrax (NGA) vaccine
- Multivalent equine encephalitis vaccine (VEE/EEE/WEE)
- Marburg (a filovirus) vaccine
- Common diagnostic system for BW agents and endemic infectious disease
- Brucellosis vaccine
- Multiagent vaccine demonstration with a single vaccine candidate comprising components for protection from at least three biological threats

Three medical biological defense programs are planned for transition to Phase 1 (Program Definition and Risk Reduction) in FY01:

- Plague vaccine
- Next Generation Anthrax (NGA) vaccine

- Ricin vaccine

For the far-term, the medical biological defense technology base looks to continue research on a vaccine for the Ebola virus; exploit the DARPA program transitions listed above into candidate medical products or systems; develop advanced therapeutics against validated biological threats and advanced diagnostics to aid in applying such treatments; alternate methods for delivering vaccines and therapeutics, and exploiting genomics, proteomics, and immunomodulation for generation-after-next medical countermeasures. To aid in transitioning medical biological defense concepts and technologies to the advanced developer, the technology base, the Joint Vaccine Acquisition Program (JVAP), and the JVAP Prime Systems Contractor are working together to streamline the acquisition process by exploiting the concepts and underlying principles contained in the new DoDD 5000.1.

8.2 Chemical Sub-Area

8.2.1 Near-Term

Near-term advanced development objectives include successful completion of testing and fielding of the Topical Skin Protectant (TSP) that protects against both mustard and nerve agents by preventing contact with the skin. The FDA licensed the Topical Skin Protectant on 17 February 2000 as SERPACWA. The fielding of the Antidote Treatment – Nerve Agent Autoinjector (ATNAA) in FY01 will simplify and speed administration of life saving antidotes against nerve agents by replacing two autoinjectors with a single autoinjector. Patient Wraps will be procured again (last procured in 1991) after new versions are assessed.

Current and Near-Term Systems (FY01-02)

NAPP Tablets
SERPACWA
Sodium Nitrite
Sodium Thiosulfate
NAAK; MANAA; CANA
Patient Wraps
M40 Vision Correction
Decontaminable Litter
Forward Deployable Nerve Agent Exposure Kit
ATNAA

8.2.2 Mid-Term

In the mid-term, an advanced anticonvulsant for quickly stopping CWA-induced seizures and reducing seizure recurrence will be developed.

Mid-Term Systems (FY03-07)

Advanced Anticonvulsant

8.2.3 Far-Term

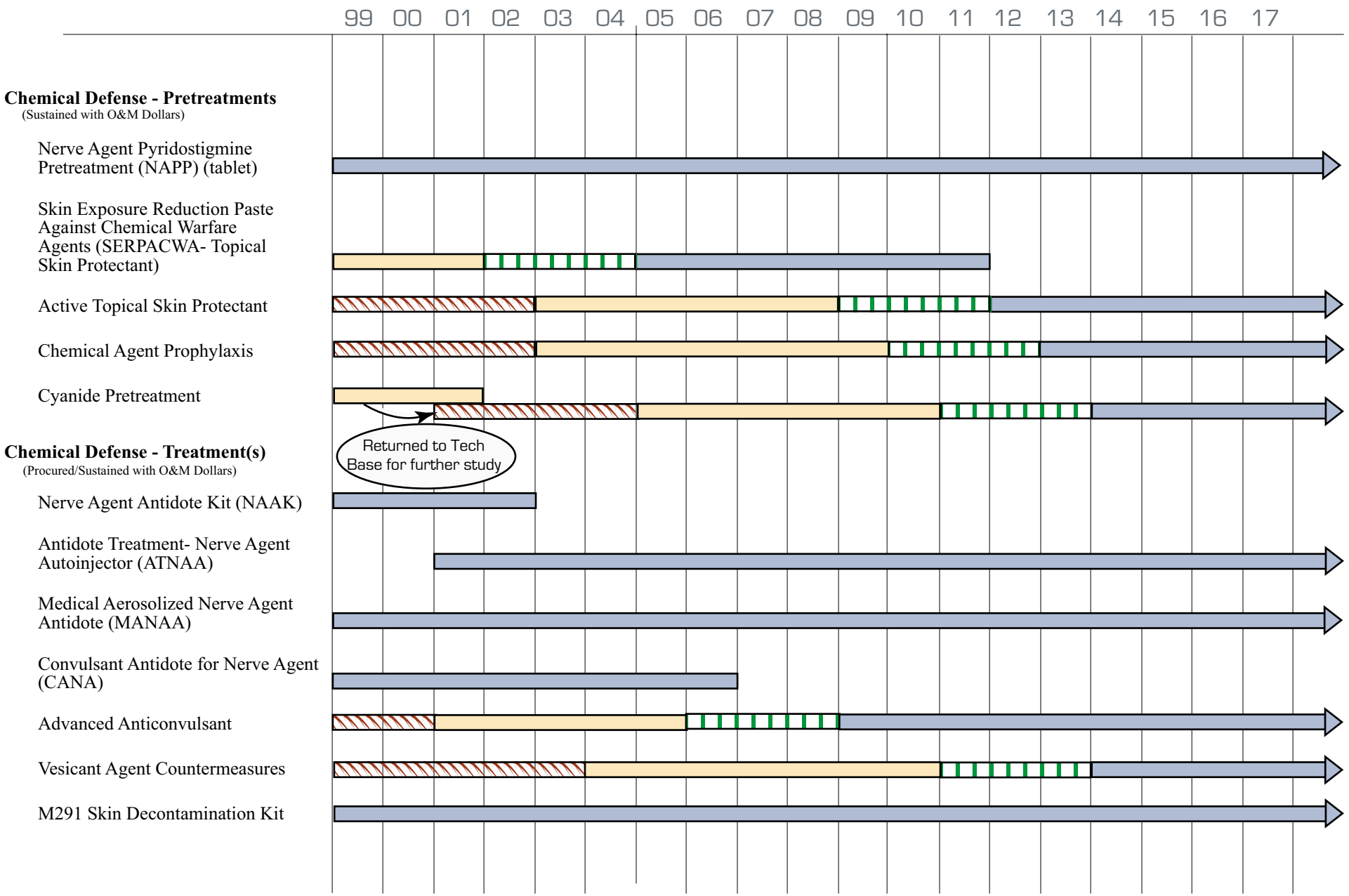
Far-term efforts focus on developing catalytic bioscavenger molecules to prevent the effects of a broad range of CW agents, and the development of medical countermeasures (including prophylaxis/pretreatment) against vesicants. The medical community is also researching new methods to quickly diagnose chemical casualties in the field. By decreasing the overall time from exposure to medical response, post-exposure treatments are more likely to be successful in saving lives. A promising pretreatment for cyanide exposure has been returned to tech base due to undesirable toxic effects in primates. Other likely candidates have been identified and applied research studies are planned.

Far-Term Systems (FY08-17)

Chemical Agent Prophylaxis
Active TSP
Vesicant Agent Countermeasures
Cyanide Pretreatment

Medical Systems

Note: Medical items require FDA approval before fielding.

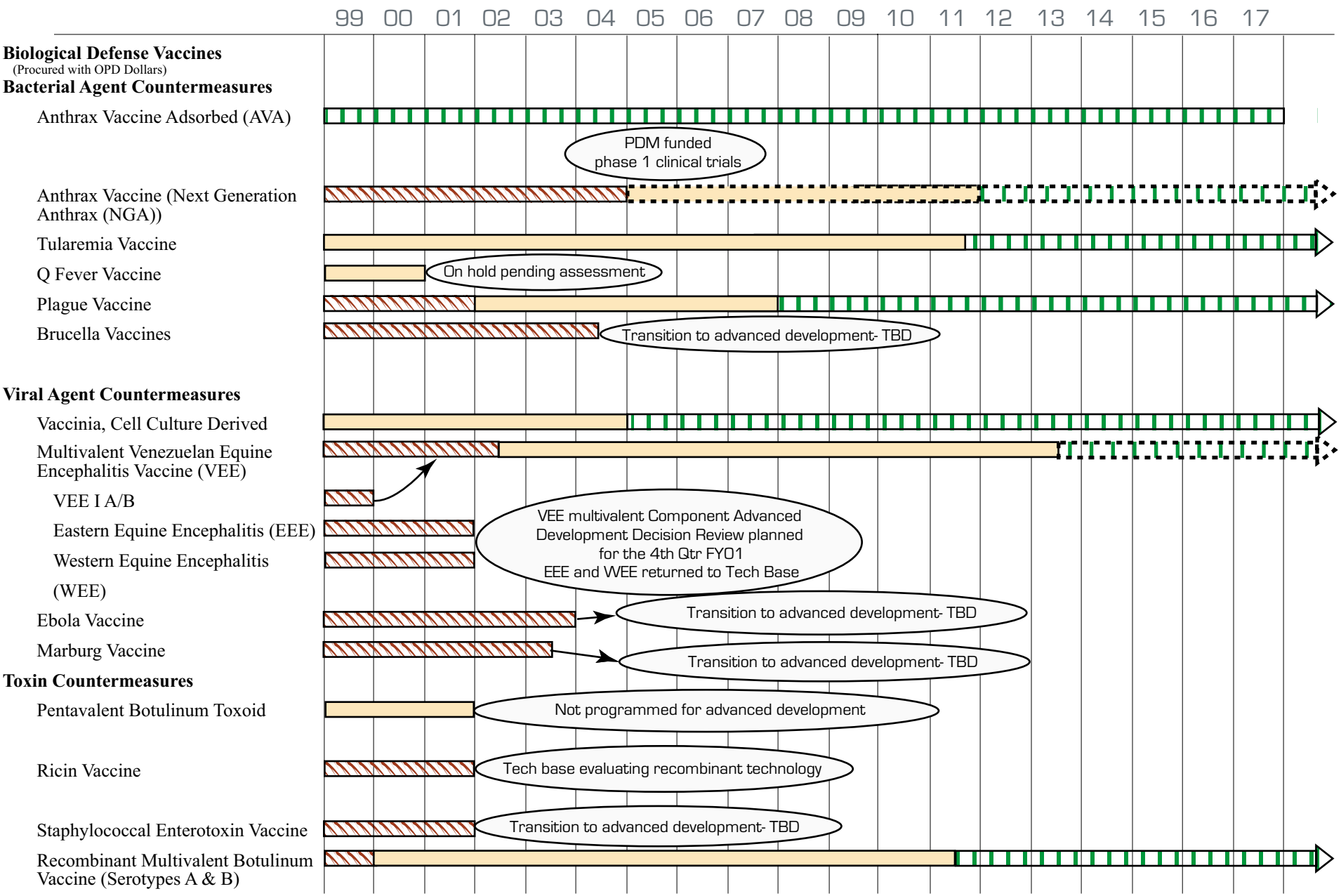


Several medical items contain dated material and therefore production is continuous.

Figure D-5-1

Medical Systems

Note: Medical items require FDA approval before fielding.

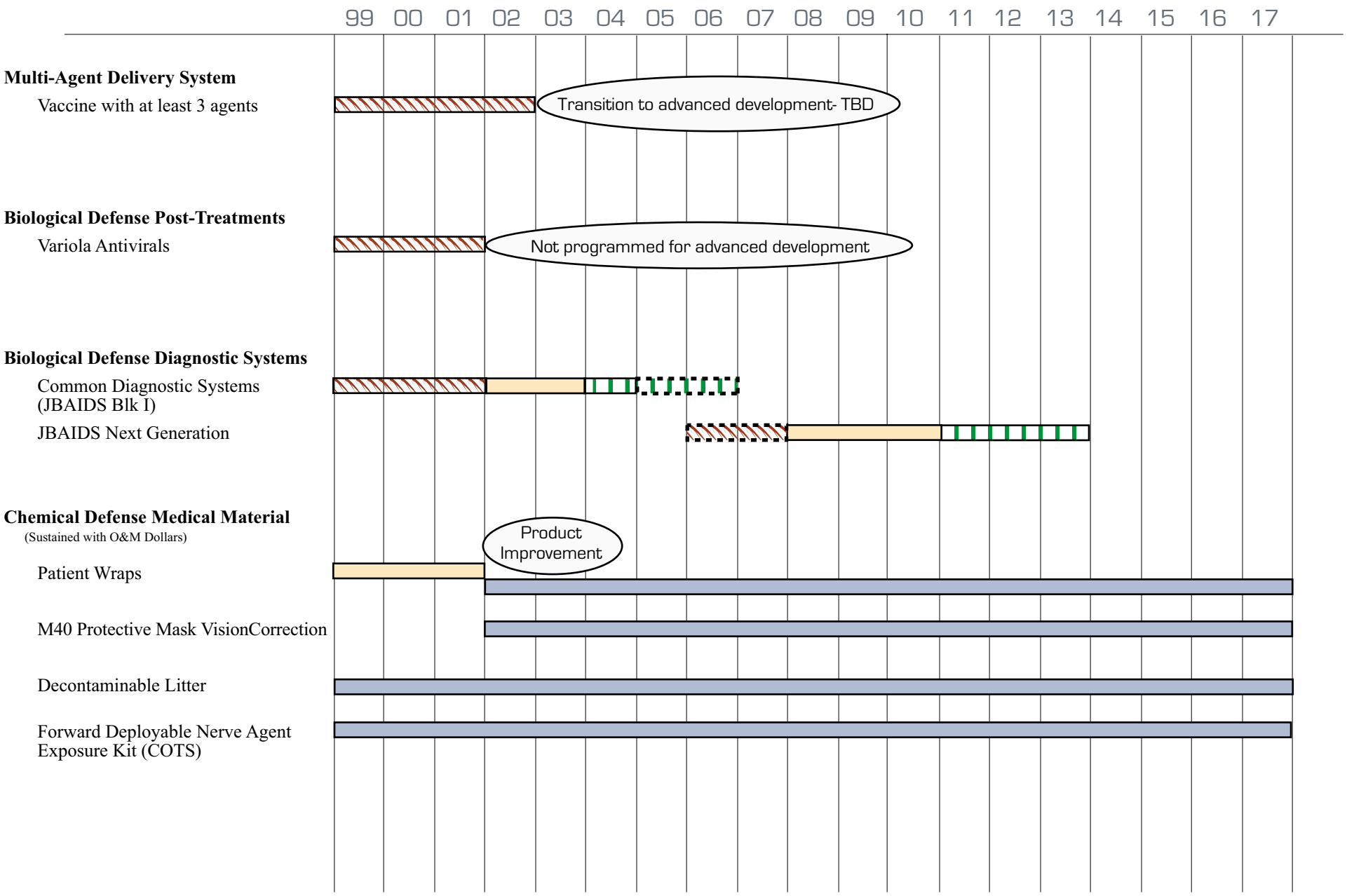


Several medical items contain dated material and therefore production is continuous.

Figure D-5-2

Medical Systems

Note: Medical items require FDA approval before fielding.

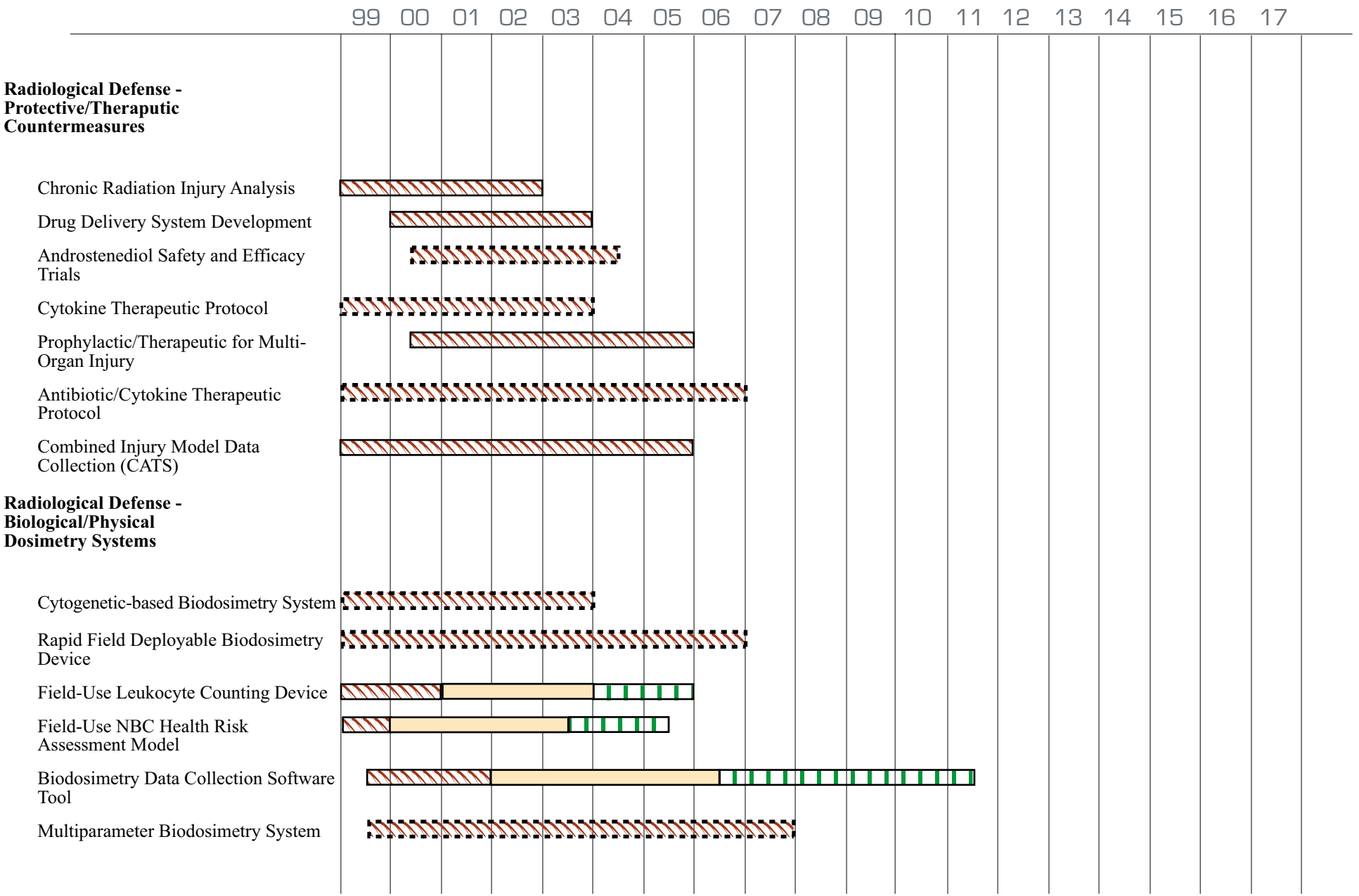


Several medical items contain dated material and therefore production is continuous.

Figure D-5-3

Medical Systems

Note: Medical items require FDA approval before fielding.



Several medical items contain dated material and therefore production is continuous.

Figure D-5-4

8.3 Biological Sub-Area

8.3.1 Near-Term

The near-term medical biological objective is a reduction in the immunization schedule of the licensed anthrax vaccine. Near-term objectives include: (1) continuing the advanced development and FDA licensure efforts for vaccines against Q fever, smallpox, tularemia, and botulinum neurotoxins (2) initiating new vaccine advanced development and licensure efforts for vaccines against plague, ricin, anthrax (Next Generation Anthrax (NGA) Vaccine) and a multivalent equine encephalitis vaccine (e.g., a combined vaccine protecting against subtypes of VEE, Western and Eastern Equine Encephalitis).

Current and Near-Term Systems (FY01-02)

Anthrax Vaccine Reduced Immunization Schedule

8.3.2 Mid-Term

Mid-term objectives include: (1) completing the development, FDA licensure and production of stated baseline stockpiles and attaining warm base production capability for vaccines against Q-fever, smallpox, plague and tularemia, (2) continuing the advanced development and FDA licensure for vaccines against botulinum neurotoxins, ricin, NGA, and a multivalent equine encephalitis vaccine. The Joint Biological Agent Identification and Diagnosis System (JBAIDS) Blk I will provide the capability to quickly identify biological agents and other pathogens in collected clinical specimens and environmental samples.

Mid-Term Systems (FY03-07)

Vaccines:
Q Fever, Smallpox, e.g., Vaccinia virus (cell cultured derived)
Plague
Tularemia
JBAIDS Blk I

8.3.3 Far-Term

Far-term efforts include completing the development, FDA licensure and production of stated baseline stockpiles and attaining warm base production capability for vaccines against botulinum neurotoxins, NGA, ricin, multivalent (VEE/EEE/WEE) equine encephalitis vaccine and JBAIDS next generation. Baseline stockpiles will be stored for ready distribution, and production capabilities for licensed biological defense vaccines will be maintained with the prime vendor approach.

Far-Term Systems (FY08-17)

Vaccines:
Next Generation Anthrax (NGA)
Combined WEE/EEE/VEE
Recombinant Botulinum
Multivalent (serotypes A&B)
Ricin

8.4 Radiological Sub-Area

8.4.1 Near-Term

The near-term objectives in the radiological countermeasures program include the: (1) completion of a risk assessment for low dose and low dose-rate radiation effects; (2) the validation of a combined cytokine treatment protocol to enhance hematopoietic recovery from acute radiation exposure; (3) the preparation of a software tool to rapidly collect, integrate, and interpret dose-related diagnostic signs and symptoms for field use; and (4) performance of studies to define the

Current and Near-Term Systems (FY01-02)

Low Dose Assessment of Health Effects
Cytokine Treatment Protocol for Acute Radiation Injury
Biodosimetry Data Collection Software Tool
DU Toxicity Assessment

toxicity of embedded depleted uranium, which will include carcinogenicity and mutagenicity potential, immune system effects, and neurotoxicity. Test and evaluation of a cytogenetic-based biodosimetry system will continue in order to validate system performance using samples from human radiation therapy patient volunteers under Institutional Review Board-approved protocols.

8.4.2 Mid-Term

Mid-term radiological countermeasures program objectives include: (1) preclinical safety and efficacy evaluation of the radioprotectant 5-androstenediol, (2) development of a sustained, slow-release radioprotective drug for extended exposure protection, (3) development of a combination prophylactic and therapeutic drug protocol to treat multi-organ radiation injury, (4) developmental test and evaluation of a deployment-capable cytogenetic-based biodosimetry system, (5) incorporation of data from combined radiation and BW agent exposure studies into the Consequences Assessment Tool Set (CATS) for casualty prediction, and (6) determining toxicological effects on the immune system and carcinogenic potential from chronic exposure to tissue-imbedded depleted uranium. Research will be initiated on treatments for combined radiation/BW agent injury.

Mid-Term Systems (FY03-07)

Androstenediol Preclinical Safety and Efficacy Trials
Sustained Radioprotective Drug Delivery for Extended Exposure Protection
Combination Prophylactic/Therapeutic for Multi-organ injury
Echelon 3 Biodosimetry System
Immunotoxicity / Carcinogenicity Assessment of Embedded DU
CATS Module to Quantify Casualties from Combined Exposures

8.4.3 Far-Term

Far-term efforts focus on recommending prophylactic/therapeutic protocols for cancer prevention and combined injury, field-capable biodosimetry systems, and treatments for internal depleted uranium contamination.

Far-Term Systems (FY08-17)

Licensed Products That Reduce or Prevent Radiation-induced Cancer
Licensed Products That Reduce or Prevent Injury and Disease from Combined Exposures to NBC
Field-capable Suite of Clinical Biological Dosimetry Tests for Rapid Assessment of Exposure Doses and Injury Diagnosis
Nontoxic Chelators to Treat DU Contamination

8.5 Operational Impacts

8.5.1 Near-Term

For protection against biological warfare agents only one FDA-licensed vaccine (Anthrax Vaccine Adsorbed) exists that can be administered to U.S. forces prior to deployment. However, alternatives such as detection systems/alarms, Mission Oriented Protective Posture (MOPP) gear and, under Executive Order 13139, use of medical products in Investigational Drug status, may be called upon to protect U.S. forces during contingency operations that may involve exposure to BW agents. A JVAP Prime System Contract approach is now in place to address issues related to the advanced development, FDA licensure, baseline stockpile procurement and warm-base production capability for a limited number of BD vaccines.

The warfighters will be protected against most chemical threat agents by pretreatments, treatments, and topical skin protectants. Antiemetics to block the debilitating early symptoms of radiation injury are FDA approved, and implementation doctrine is currently being

developed. First generation radioprotective and therapeutic agents are FDA approved. The lack of fielded medical diagnostic kits (measuring individual radiation dosimetry and CB agents present in personnel at low dosages) limits the ability of front-line medical personnel to quickly evaluate and treat agent casualties.

8.5.2 Mid-Term

Force protection will be broadened to include countermeasures against a limited number (e.g., 4) of biological agents expected to be encountered in the battlespace. FDA licensed vaccines will be more readily available for Q fever, smallpox, tularemia, and plague. In addition, improved topical skin protectants, nerve agent pretreatments, and antidotes will further reduce casualties from blister and nerve agents.

Prophylactic/therapeutic drug delivery systems will allow combat commanders to maintain warfighter effectiveness in radiological contaminated environments and ultimately reduce the number of casualties that suffer long-term health consequences. A biodosimetry system will allow the first clinical evaluation of the severity of radiation exposure and, thus, guide treatment decisions at Echelon 3 facilities. Based on the toxicity assessment and accurate quantitative determination of embedded DU, treatment strategies can be employed more effectively at Echelon 4 facilities.

8.5.3 Far-Term

Forward deployable medical diagnostic kits will allow medics on the front lines to safely and quickly evaluate, monitor, and treat troops prior to the onset of lethal chemical and biological agent effects, and initiate new biotechnology-based therapy to diminish both prompt and late effects of high and low dose radiation. This will minimize casualties and maximize recovery rates so that personnel may return to duty.

The CBDP will continue to acquire a limited number of Medical Biological Defense vaccines and countermeasures through a prime systems contract approach to ensure that a warm-base production capability and baseline stockpiles are part of the medical BD inventory. New multivalent vaccines, when developed, will reduce the requirements for immunization and provide a broad spectrum of protection.

The development of effective CWA scavenging molecules, an effective reactive topical skin protectant will greatly improve warfighter survivability in a CWA environment, and rapid diagnostics will enhance the likelihood for survival and quick return to duty should the warfighter be effected by a CWA. Radiation-induced cancer/mutation preventive techniques and countermeasures for chemical-biological-radiation interaction should be fieldable.

9.0 Modeling & Simulation Commodity Area

Modeling and Simulation supports the major tenets of the Joint NBC Defense Concept and the Battle Management Functional JFOC. Modeling and simulation is used as a tool to track and maintain battlespace situational awareness, to provide warning and prediction, and for planning/modification of operations (e.g., for use in JWARN for contamination avoidance). It aids in the assessment of Joint Service doctrine, training, materiel development, and equipment design (e.g. Simulation Based Acquisition (SBA)).

Fielding of next generation, advanced models are under development to provide accurate, validated descriptions of the CB environmental threat and the challenge it presents to personnel, detectors, and protective equipment. The models also describe effects of the CB environment on the ability of joint forces to conduct fixed site (APOD/SPOD) and mobile operations. The models are intended for use in more aggregated advanced simulation systems, such as the Joint Conflict and Tactical System (JCATS), Joint Simulation System (JSIMS), and Joint Warfare System (JWARS), to allow CB warfare to be accurately depicted across the range of engagement scenarios.

The new direction outlined in the current roadmap reflects the vision outlined in the draft M&S Master Plan. That vision is for a standardized representation of the effects and environments associated with CB agent employment, reaching across the domains of analysis, training, and acquisition.

Modeling & Simulation Objectives

Mid-Term (FY03-07)

- Joint Ground Effects Model
- Joint Effects Model
- Establish data repository, standard source term data sets, toxicology standards, and validation standards
- Develop specific SBA models
- Multi-fidelity T&D models
- JWARN information system provides battlespace awareness and control

Far-Term (FY08-17)

- Joint Operational Effects Federation used for all NBC theater simulations
- Hazard Simulation System provides integrated SBA and analysis capability
- Joint Environmental Model provides real time decision battlefield management capability
- Fielding of technology improvements

The M&S program will support the warfighter, acquisition professional, and Service decision maker with a family, federation, and suite of models and simulations, which will meet their needs. The anticipated models, suites, and systems will accurately model release sources, atmospheric transport and dispersion, casualty predictions, unit degradation, defensive measures, and all CBD operational equipment.

9.1 Technology Base

The M&S technology base efforts focus on technologies that will provide improved Transport and Diffusion (T&D) methodologies; address specific environmental flow regime issues, such as high altitude and urban T&D methodologies; fixed site simulations; and supporting first principles physics, chemistry, and meteorology efforts. In addition, advances in

conflict simulation methodologies and distributed information systems efforts are being pursued with Simulated Training and Analysis for Fixed Facilities/Sites (STAFFS) and Nuclear, Chemical, Biological, and Radiological (NCB-R) simulator programs. The technology base efforts also collaborate with both the weapons effects and medical communities to address source term and toxicology issues. The JFOCs addressed are BM-BA (Battle Management – Battle Analysis), and BM-BS (Battle Management – Battle Management Systems).

9.2 Modeling and Simulation Systems

9.2.1 Near-Term

The current plans are depicted in the roadmaps in accompanying Figures D-6-1, D-6-2, and D-6-3. This perspective of the way ahead is based upon Mission Needs Statement and Operational Requirements Document efforts ongoing within the JSIG. These efforts will document requirements in each of the three critical areas; analysis, operations, and training.

Current and Near-Term Systems (FY01-02)

JWARN
STAFFS
GRIDGEN/BIOSTRIKE
NCB-R Simulator
VLSTRACK
CWNAVSIM

9.2.2 Mid-Term

In the mid-term, efforts are envisioned to include significant standardization programs to address current deficiencies in Validation, Verification, and Accreditation (VV&A), critical data sets, and software architecture. The Joint Effects Model (JEM) will bring together the full spectrum of T&D methodologies in an accredited system of modeling capabilities.

Mid-Term Systems (FY03-07)

JWARN Info System
JGEM
NCB-R Simulator
Joint Effects Model
Joint Operational Effects Federation
Training System
SBA Virtual Prototyping Suite

Likewise, the Joint Operational Effects Federation (JOEF) and SBA Virtual Prototyping Suite (VPS) will provide users with single entry points to the entire functional domain. The Training System will provide the training community with the tools they need to train warfighters in the way they will be expected to fight.

9.2.3 Far-Term

Far-term efforts will address the entire spectrum of warfighter needs for hazard analysis, battlefield management, and situational awareness through use of the Hazard Simulation System. This "system of systems" will make use of the capabilities available through spiral development efforts within the JEM, JOEF, NCB-R Simulator, and SBA VPS.

Far-Term Systems (FY08-17)

JWARN Blk III
Joint Effects Model
Joint Operational Effects Federation
Training System
SBA Virtual Prototyping Suite
Hazard Simulation System

The Hazard Simulation System will bring all of these elements together in a software system that will allow the user to define the situation and time critical needs while taking advantage of all accredited models and data sources.

Modeling and Simulation

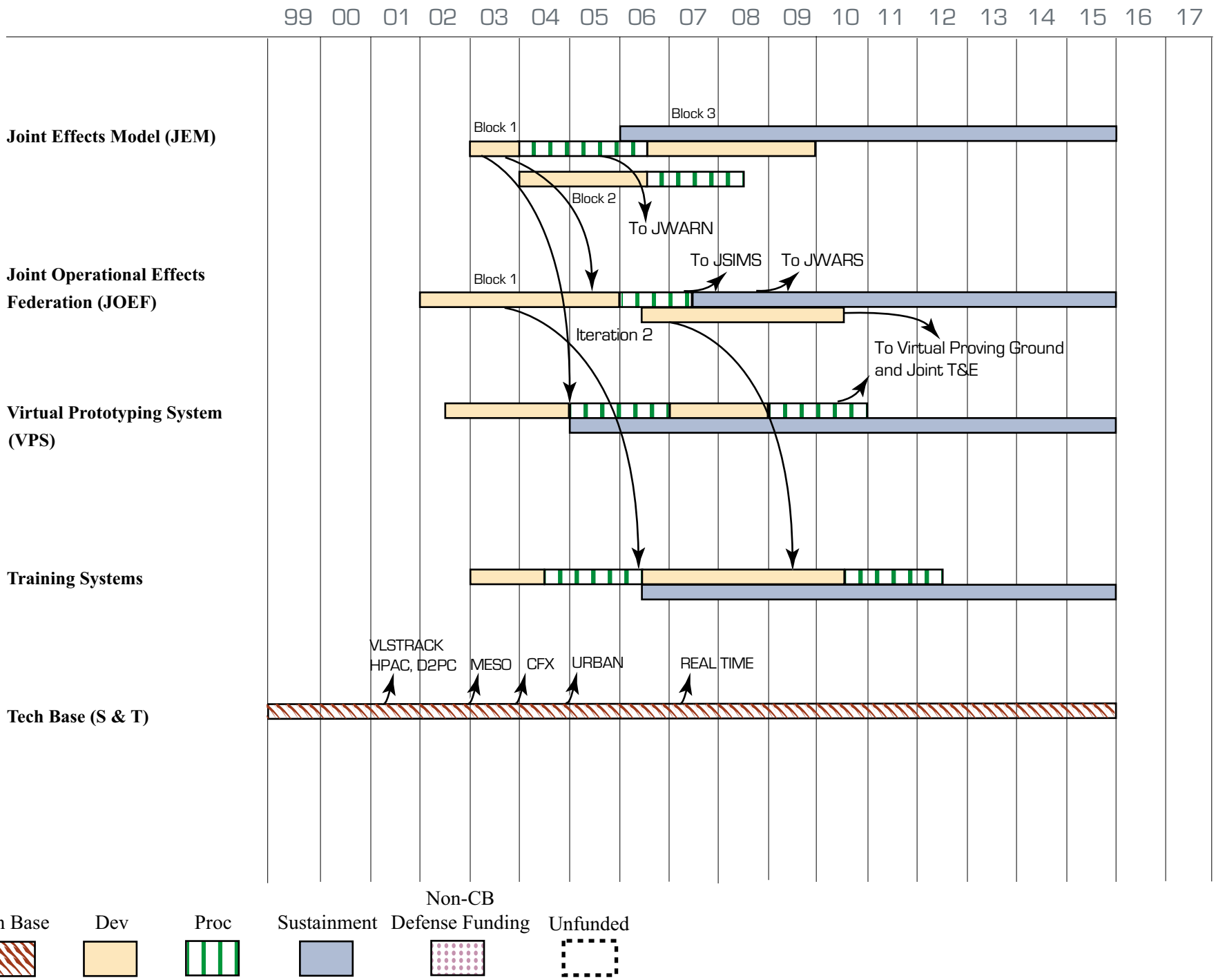


Figure D-6-1

Modeling and Simulation

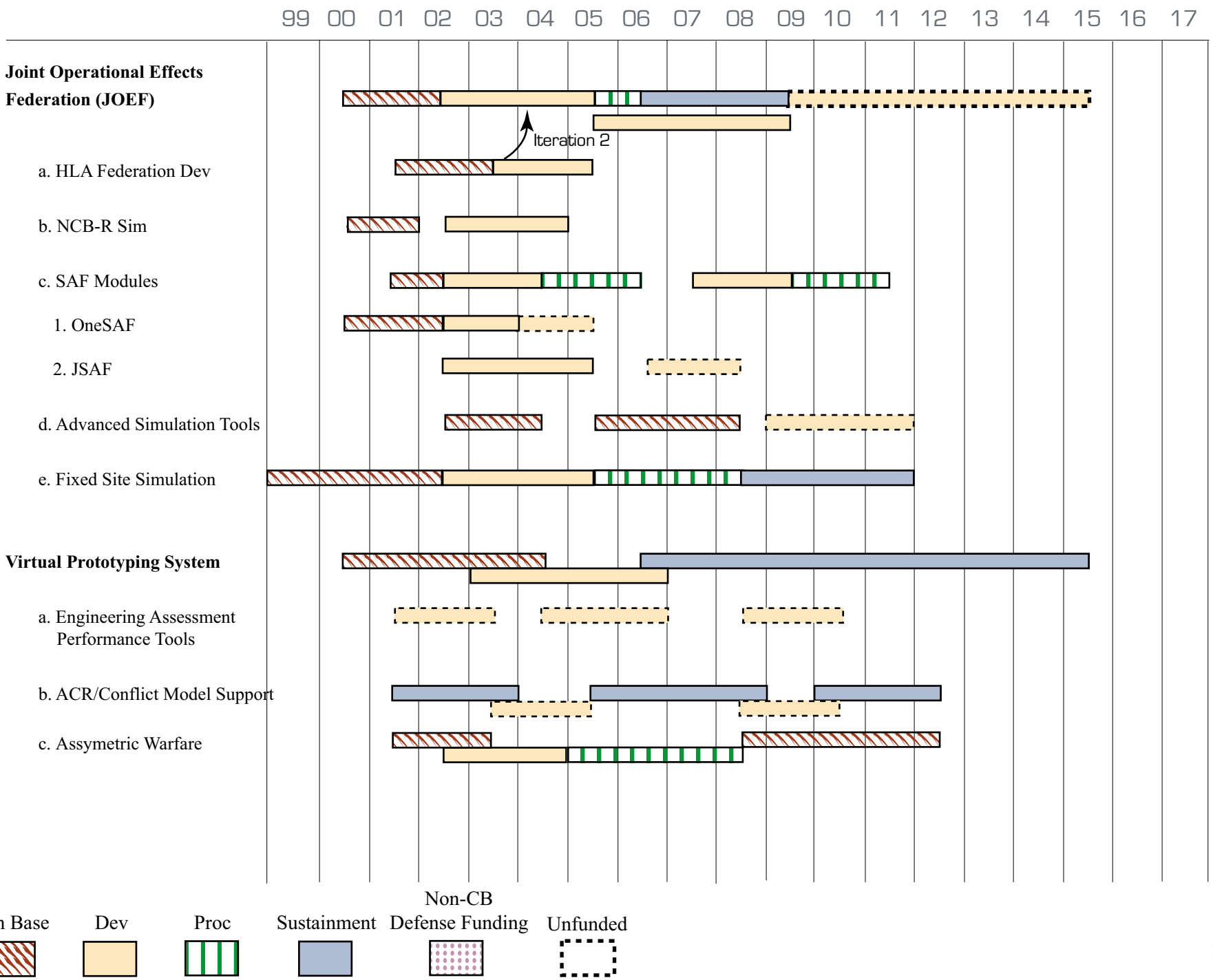


Figure D-6-2

Modeling and Simulation

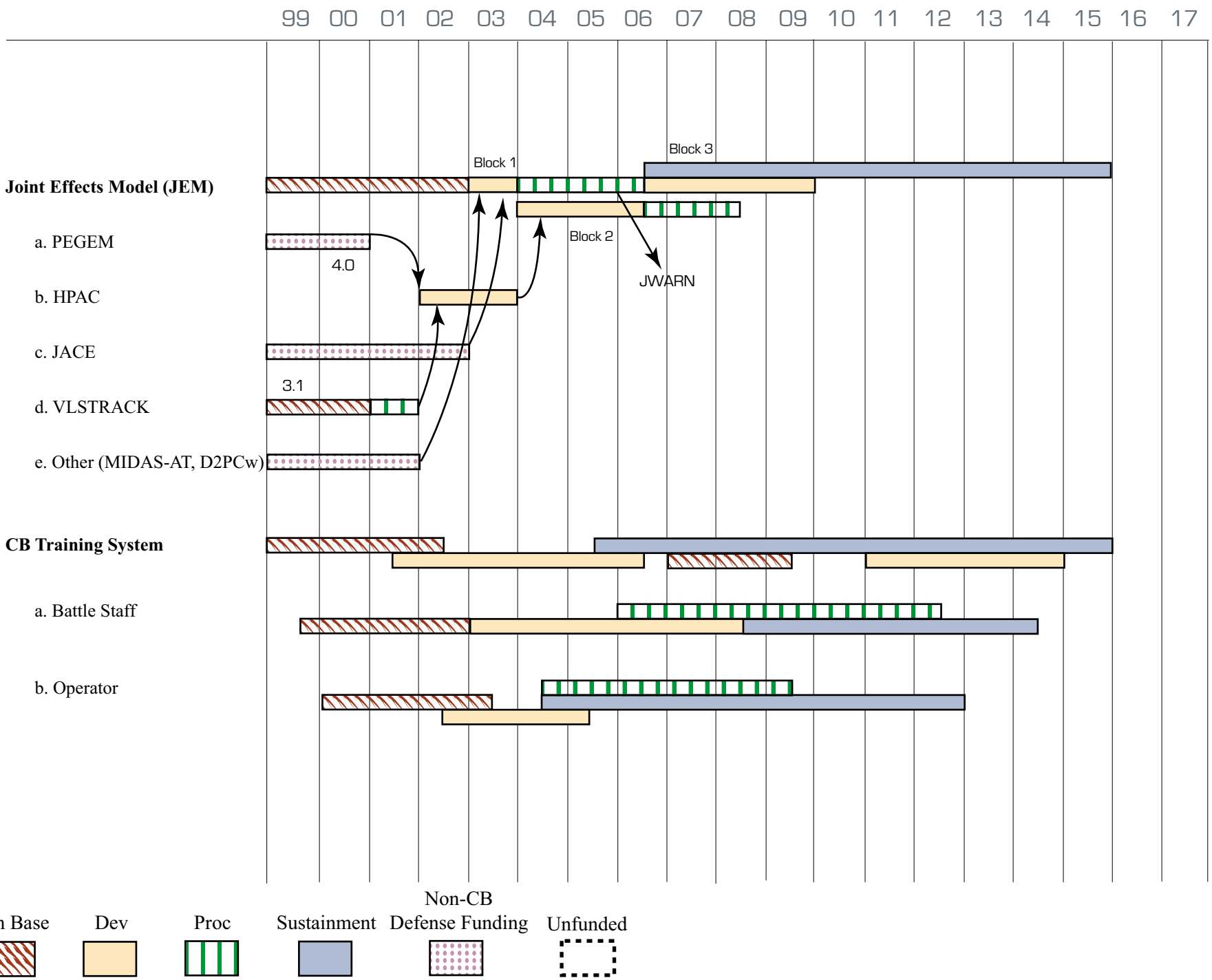


Figure D-6-3

9.3 Operational Impacts

9.3.1 Near-Term

Current modeling capabilities allow the warfighter to conduct significant scenario simulations prior to engagements and to train in a realistic manner. Recent advances allow CBD planning to be folded into larger Conflict Simulation and CoM tools via simulations called STAFFS and the NCB-R Simulator. The SBA tools for detectors will continue to be used in conjunction with CBD environment models to affect cost avoidance for several Service detector and platform acquisition programs.

9.3.2 Mid-Term

The next generation T&D methodologies will provide a multi-fidelity capability, which will allow the warfighter increased flexibility and responsiveness to threat and hazard predictions. Work with the counterproliferation community will result in a unified approach to hazard predictions, which will meet the warfighter requirement for one tool and one answer.

Advances in hardware system modeling will become part of the SBA VPS to provide improved acquisition program performance, as well as battlefield simulation and training tools. Fixed site conflict simulation models for APOD and SPOD will be accredited for use and used to plan responses to potential threats on critical air bases and ports.

9.3.3 Far-Term

The far-term capabilities will include a real-time operational hazard prediction capability providing the warfighter with real time battlefield management and control. Operational warning and reporting via JWARN will allow the warfighter to avoid contamination and to field decontamination resources to their greatest advantage.

Ongoing efforts will keep abreast of specific contamination avoidance, decontamination, medical, and protection systems characteristics, and models will be incorporated to support the warfighter's ability to evaluate and plan for advances. Acquisition professionals will perform continuous cost avoidance activities using the VPS in conjunction with the JOEF. Design characteristics, test plans, and operational deployment efficacy will be evaluated using SBA tools provided by these programs. Integrated conflict simulation capabilities are also envisioned to meet theater and strategic simulation requirements. Training will be effective and provide the community with the ability to train the way we operate.

10.0 Advanced Concept Technology Demonstrations (ACTDs)

Advanced Concept Technology Demonstrations (ACTDs) exploit mature and maturing technologies to solve important military problems and high priority JFOCs. A declining budget, significant changes in threats, and an accelerated pace of technology development have challenged our ability to adequately respond to rapidly evolving military needs. In addition, the global proliferation of military technologies, resulting in relatively easy access to these

technologies by potential adversaries, has further increased the need to rapidly transition new capabilities from the developer to the user.

This section describes the rationale and objectives of our CB defense ACTD program. A comprehensive summary of the objectives and operational impacts are included for each of the individual ACTDs that have been approved and that are envisioned to date.

In early 1994, the DoD initiated a new program designed to help expedite the transition of maturing technologies from the developers to the users. The ACTD program was established to help the DoD acquisition process adapt to today's economic and threat environments. ACTDs emphasize technology assessment and integration rather than technology development. The goal is to provide a prototype capability to the warfighter and to support him in the evaluation of that capability. The warfighters evaluate the capabilities in real military exercises and at a scale sufficient to fully assess military utility.

ACTDs are designed to allow users to gain an understanding of proposed new capabilities for which there is no user experience base. Specifically, they provide the warfighter an opportunity:

- To develop and refine warfighter concept of operations to fully exploit the capability under evaluation;

- To evolve the warfighter operational requirements as he/she gains experience and understanding of the capability; and

- To operate militarily useful quantities of prototype systems in realistic military demonstrations, and on that basis, assess the military utility of the proposed capability.

At the conclusion of the ACTD operational demonstration, there are three potential outcomes. The user sponsor may recommend acquisition of the technology and fielding of the residual capability that remains at the completion of the demonstration phase of the ACTD to provide an interim and limited operational capability. If the capability or system does not demonstrate military utility, the project is terminated or returned to the technology base. A third possibility is that the user's need is fully satisfied by fielding the residual capability that remains at the conclusion of the ACTD, and there is no need to acquire additional units. The ACTDs are illustrated on the ACTD roadmap in figure D-7-1.

10.1 Current and Near-Term ACTDs

Current and Near-Term ACTDs (FY01-02)

JBREWS
Portal Shield (XM99)
RestOps
Force Medical
Protection/Dosimeter
JMANS

Joint Biological Remote Early Warning System (JBREWS) ACTD

Objectives:

- To evaluate the utility of an early warning capability that allows a compressed decision cycle to warn, report, and protect deployed forces.

- Employs a system of distributive BW agent sensors.
- Components include the JBREWS architecture, the Deployable Unit Biological Detection System, the Short Range-Biological Stand-off Detection System (SR-BSDS), an interface with JWARN and the supporting concept of operations and doctrine.
- Provide the following organic BW detection, identification and warning to maneuver forces in assembly areas: an integrated command and control system to assist base personnel in rapid assessment; warning and dissemination of attack data; unmasking procedures; contamination detection sampling kits; tested tactics, techniques, and procedures.

Operational Impact(s): Deployed forces medical personnel will have ability to detect and identify BW agents for the purpose of correctly diagnosing symptoms and treating personnel after a BW attack.

Air Base/Port Biological Detection (Portal Shield) ACTD

Objectives:

- Field interim systems to CINCs that provide rapid, automated biological agent detection, identification and warning (in less than 25 minutes) to high value fixed sites (e.g., ports and airfields).
- Automated "smart" sensor network.
- Chemical sensor interfaces for automated biological and chemical network warning and reporting.
- An interface with JWARN and the supporting concept of operations and doctrine.
- Provide the following "residuals" to the fixed sites: Provides the base commander an automated network of sensors, an integrated command and control system to assist base personnel in rapid assessment; warning and dissemination of attack data; unmasking procedures; contamination detection sampling kits; tested tactics, techniques, and procedures.

Operational Impact(s): Fixed site base medical personnel will have ability to detect and identify BW agents for the purpose of correctly diagnosing symptoms and treating personnel after a BW attack. Additionally with the chemical add–on sensors a detect–to-warn will be automated enabling base personnel to don chemical protective gear in time to avoid contamination thereby maintaining personnel at higher readiness levels.

Restoration of Operations (RestOps) at Fixed Sites ACTD

Objectives:

- Demonstrate actions contributing to protecting against, and the response to, a CB attack in order to restore combat operations and OPTEMPO in mission execution at fixed sites. In particular, RestOps aims to:
- Determine CB collection, detection, identification, and warning that is achievable to reduce vulnerabilities;
- Identify effective methods of pre-attack protection of personnel and critical equipment while maintaining operational agility;

- Establish expedient methods of post-attack decontamination of personnel and personal equipment;
- Offer enhanced decontamination of critical equipment and facilities necessary to restore and sustain operations;
- Supply enhanced ability to determine the extent and location of contamination;
- Provide for improved post-attack medical treatment to exposed personnel; and
- Capture lessons learned for incorporation into Joint, multiservice, and Service doctrinal institutions.

Operational Impact(s): An Air Base commander will have chemical and biological defense equipment, tactics, and procedures available to maintain OPTEMPO after either a chemical or biological warfare attack on the base.

Force Medical Protection/Dosimeter ACTD

Objectives:

- Determine the military utility of individually worn chemical and biological samplers and alarm using passive sampling methodology.
- Include real-time analysis, an alarm to warn the wearer of an immediate chemical hazard, and a trap for biological agents for future analysis.

Operational Impact(s): Individual soldiers will have warning of low-level concentration in time to enable them to protect themselves from dangerous level concentration.

Proposed Joint Multi-Mission Advanced NBC System (JMANS) ACTD

Objectives:

- The JMANS will provide Joint Forces the capabilities of real-time NBC detection, warning, and reporting through multimission sensor integration and the integration of NBC sensors with other data sources.
- JMANS will fully integrate the NBC data fusion and battlespace management system, the look-down detection and identification component, and the multimission sensors into the existing user command and control communications architecture.

Operational Impact(s): JMANS will develop a system that blends NBC situational awareness, sensors, sensor management, and early warning capabilities into a truly integrated and fully interoperable Joint Force capability.

Advanced Concept Technology Demonstrations (ACTDs)

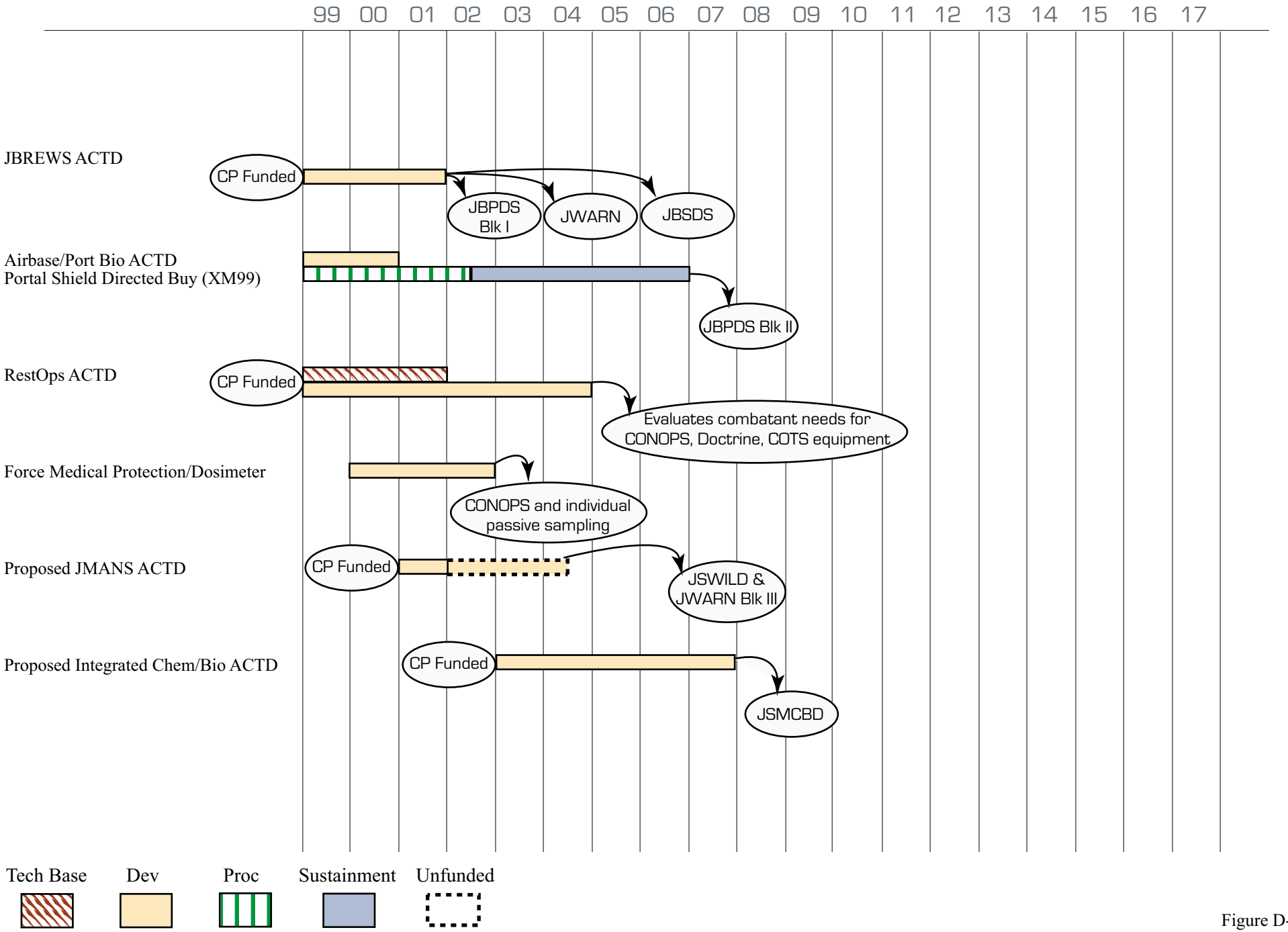


Figure D-7-1

10.2 Mid-Term ACTDs

Proposed Integrated Chem/Bio ACTD

Mid-Term ACTDs (FY03-07)

Integrated Chem/Bio ACTD

Objectives:

- A follow-on effort to RestOps using the methodology employed by RestOps, (e.g., integrate and demonstrate mature technologies and tools used to mitigate adverse effects and restore operations at a fixed site before, during, or after an attack of either CW or BW, in order to support operational war plans). In this case the fixed site will be a Sea Port of Debarkation.
- Develop new CONOPS and tactics, techniques, and procedures for executing Contamination Avoidance for Sea Port of Debarkation (CASPOD) contingencies at a fixed site based upon technologies employed in the marine environment.

Operational Impact(s): A Commander in Chief (e.g. CENTCOM or PACOM) executing logistics throughput operations at a Sea Port through either Army or Navy units offloading Strategic Sealift shipping will have Chemical and Biological defense equipment, tactics, and procedures available to maintain OPTEMPO after either a CW or BW attack on the sea port.

Section E: Overall Assessment

1.0 Commodity Area Overview

Our program assessments identify stable contamination avoidance, individual protection, and medical defense programs, and deficient collective protection, decontamination, and modeling and simulation programs. Table 2 indicates the fiscal and technological assessment of each of the commodity areas for the near-, mid-, and far-term.

Commodity Area	Near-Term		Mid-Term		Far-Term	
	Fiscal	Tech	Fiscal	Tech	Fiscal	Tech
Contamination Avoidance	Amber	Amber	Amber	Amber	Green	Green
Individual Protection	Amber	Amber	Amber	Amber	Green	Green
Collective Protection	Red	Amber	Amber	Amber	Amber	Amber
Decontamination	Amber	Red	Green	Amber	Green	Green
Medical Systems	Amber	Amber	Amber	Amber	Amber	Green
Modeling and Simulation	Red	Amber	Red	Amber	Red	Amber
OVERALL	Amber	Amber	Amber	Amber	Amber	Green

Green, Fiscally Constrained - Adequate funding/industrial base to fully meet requirements in 2 MTWs through fielded systems.
Green, Technology Constrained - Adequate technology base to support commodity area modernization objectives.

Amber, Fiscally Constrained - Reduced funding/industrial base to fully meet requirements in 2 MTWs through fielded systems.
Amber, Technology Constrained - Reduced technology base to support commodity area modernization objectives.

Red, Fiscally Constrained - Inadequate funding/industrial base to meet requirements in 2 MTWs through fielded systems.
Red, Technology Constrained - Inadequate technology base to support commodity area modernization objectives.

Table 2. Commodity Area Status

Contamination avoidance remains “Amber” in the near-term and mid-term due to the inability to rapidly disseminate NBC agent information throughout the battlefield; the inability to detect liquid chemical agent at a distance; and limited capability for detection and identification of biological clouds. The far-term improves modernized stand-off and point detection capabilities combined with an advanced warning and reporting battlespace management program enabling transmission of information across all Services. Maintaining level procurement will allow the contamination avoidance commodity area to meet the current 2 MTW requirements in the far-term.

Near-term and mid-term individual protection will remain “Amber” as the Services transition from several CB protective ensembles to one Joint suit under JSLIST. Current suits are not launderable, reusable or fully decontaminable. Far-term procurement of the single groundcrew mask, single aircrew mask, and integrated CB protective ensembles that reduce degradation and maintain force effectiveness will have to be funded at substantially greater levels to prevent obsolescence of cascading equipment.

Collective protection will be “Red” in the near-term and "Amber" in the mid-term. Although integrated collective protection systems continue to increase in number, the relatively small number of systems available to warfighters remains a high risk. Collective protection

shelters do not have support from all the Service non-NBC communities to mitigate the challenges. Reliance on charcoal filters and minimum CPE will not support full dimensional protection.

Decontamination will be technologically rated “Red” in the near-term, but improve to "Green" in the mid-term with the procurement of the JSFXD and increased investments. More clearly defined user requirements have raised awareness that new decontamination technologies require further study before they can be transitioned to development programs. The MDS offers significant improvements in equipment decontamination operations and the JSFXD will address deficiencies in the decontamination of mission critical areas of ports, airbases, and other fixed sites. The inability to decontaminate sensitive avionics and electronics is currently a major deficiency, but is being addressed in the JSSED Program.

Medical NBC Defense systems are “Amber” throughout the timeframe as new vaccines and prophylactic drugs await FDA approval, a time-consuming and risky process. Currently there is a lack of vaccines and prophylactics to combat all radiological, biological and chemical agents. Improved rapid diagnostics and the development of new therapeutics could improve the far-term outlook.

Modeling and Simulation will be “Red” in near-, mid-, and far-terms due to the current funding status. Funds have not been identified to support Technology Demonstration, PDRR, or EMD phases of development. More clearly defined operational requirements will result in focused efforts coordinated throughout DoD and other Federal Agencies. In addition, the comprehensive programmatic approach currently being pursued will result in significant progress in the near future. However, the supporting technology base efforts continue to be unable to address the full spectrum of technical needs, resulting in an overall “Amber” status.

In summary, in the near-term (today through FY02), combat forces have critical NBC defensive capability shortfalls that can be partially corrected during the mid-term (FY03 to FY07). The outlook for the far-term (FY08 to FY17) can be optimistic if the plan is implemented and adequately resourced.

The overall DoD NBC Defense program is assessed to be “Amber” (reduced capability to fully meet all CINC requirements), however, the assessment can improve to "Green" in the far-term with additional funding. Modernization efforts across the commodity areas will significantly improve capabilities in some areas (notably biodetection programs) while maintaining current capabilities in others (such as decontamination and collective protection). At no time during the POM will we be able to procure sufficient quantities of end items to meet the demands of two, nearly simultaneous MTWs. This can only be corrected with additional procurement funds.

2.0 The NBC Defense “System of Systems”

The RDA plan has provided examples to illustrate the concept of an NBC Defense “system of systems.” NBC Defense equipment must work in synchrony to visualize the battlespace, protect the force, and restore the force when operating in contaminated

environments. The overall RDA process is designed to provide the variety of equipment necessary to fully assess the battlespace threats and protect against them. Developing superior contamination avoidance programs without also developing decontamination and protection programs will result in an unbalanced "system of systems" that cannot reach its full potential of minimizing casualties and maximizing OPTEMPO.

Our plan reflects an emphasis on contamination avoidance, and specifically in developing capabilities for chemical stand-off and biological point and early warning detection. However, to maximize the benefits of technical advances in detection capability, the plan also directs attention to:

- Take advantage of information technology advances and field the JWARN system to improve situational awareness.

- Addressing shortfalls that exist within the protection and decontamination areas to successfully support the full range of CINC requirements. The impact of these commodity areas on force lethality and OPTEMPO cannot continue to be overlooked.

This RDA plan outlines improvements to satisfy CINC requirements; however, adequate resources must be provided to bring to bear all the capabilities needed to achieve our objectives. Failure to maintain a robust CB defense capability may result in unnecessary risk to U.S. Forces. Moreover, the CB defense community is actively coordinating with the DOE and DARPA to ensure programs are integrated to leverage the best capabilities for the warfighters. Many of our objectives are best achieved – or can only be achieved – by leveraging opportunities created through coordination. The FY03 program and beyond is balanced, coordinated, integrated, and the Joint community is committed to being the clear, unequivocal world leader in CB defense.

APPENDIX A:

NBC DEFENSE JOINT PRIORITY LIST (JPL)

The Joint Priority List (JPL) is a product mandated by the Joint Service Agreement and developed by the Joint Service Integration Group (JSIG). To facilitate the prioritization process, the JSIG utilized the analytical tool *Team Expert Choice*, which is based on the Analytic Hierarchy Process (AHP) decision-making methodology. AHP permits the structuring and solving of complex problems involving many criteria and courses of action. Using *Team Expert Choice*, medical, non-medical and stakeholder representatives developed criteria, structured the criteria into logical sets, derived the relative priority of the criteria, and evaluated each program based on the criteria to prioritize the Joint Service Nuclear, Biological, and Chemical (NBC) Defense programs. Appendix A provides an integrated priority list. This list provides the material developer a template to identify prioritized near-, mid-, and far-term operational capabilities of the Service's warfighters and CINCs.

FY01 NBC Defense Joint Priority List

Rank		Program
1		Joint Biological Standoff Detection System (JBSDS)
2		Biological Standoff Detection
3		Joint Service Chemical Warning and Identification LIDAR Detector (JSWILD)
4		Hybrid LIDAR
5		Remote Sensing Chemical Agent Alarm System (RSCAAL)
6		Joint Service Wide Area Detector (JSWAD)
7		Joint Biological Point Detection System (including Block II & Portal Shield) (JBPDS)
8		Scanning Airborne Emission For Gaseous Ultraspectral Analysis & Radiometric Detection (SAFEGUARD)
9		Critical Reagents Program (CRP)
10		Joint Biological Tactical Detection System (JBTDS)
11		Laser Standoff Chemical Detection Technology
12		Joint Service Lightweight Standoff Chemical Agent Detector (JSLSCAD)
13		Chemical Biological Individual Sampler (CBIS)
14		Chemical Imaging Sensor (DTO)
15		Joint Modular Chemical and Biological Detector
16		Interim Biological Agent Detector (IBAD)
17		Post Exposure Chemotherapeutics for BW Agents
18		Joint Chemical/Biological Agent Water Monitor (JCBAWM)
19		Reagent Development
20		Joint Warning & Reporting Network (includes Block II)(JWARN)
21		Biological Vaccines - Anthrax (Old)
22		Biological Sample Preparation System for Biological Identification (DTO)
23		Joint Service Lightweight NBC Reconnaissance System (JSLNBCRS)
24		Smallpox Vaccine
25		Bio Sensors
26		Biological Detection Technology
27		Biological Point Detection
28		Tularemia Vaccine
29		Staphylococcus Enterotoxin Vaccine
30		Anthrax Vaccine (Next Generation)
31		Joint Service Fixed Site Decontamination System (JSFXD)
32		Navy Individual Protective Gear (NIPG)
33		Clostridium Botulinum Toxin Medical Defense System (CBT-MDS)
34		Brucella Vaccine
35		VEE/EEE/WEE Vaccine
36		Joint Service Sensitive Equipment Decontamination (JSSED)
37		Q Fever Vaccine
38		Reconnaissance System, Fox NBC (NBCRS) MODS (NBCRSBLKI&II)
39		Yersina Pestis (Plague Vaccine)

Note: Medical programs highlighted

FY01 NBC Defense Joint Priority List (cont.)

Rank		Program
40		AERP Aircraft Modifications (AERPMODS)
41		Second Skin (MCU-2P SS)
42		Improved Chemical Agent Detector (ICAM)
43		Joint Chemical Agent Detector (JCAD)
44		Joint Service Mask Leakage Tester (JSMLT)
45		Protection Assessment Test System (PATS) (M41)
46		Joint Chemical Environmental Survivability Suit (JCESS)
47		Topical Skin Protectant - Skin Exposure Reactive Paste Chemical Warfare Agent (SERPACWA)
48		Technology Transfer for Bio Sensors (TT)
49		Liquid Surface Detection (LSD)
50		Joint Chemical Environment Survivability Mask (JCESM)
51		Early Warning Detection
52		Filovirus Vaccine (Ebola, Marburg)
53		Helo Upgrade (Marines) A/P-23P-14-P
54		NBC Reconnaissance System (NBCRS) (formerly CBRIDS)
55		Improved Point Detection System (IPDS)
56		CB Respiratory System - Air Crew (CBRSA)
57		Multichambered Autoinjector (Antidote Treatment, Nerve Agent Autoinjector)(ATNAA)
58		Automatic Chemical Agent Detector and Alarm (ACADA)
59		New Detection Technologies
60		Joint Biological Agent Identification and Diagnosis System (JBAID)
61		Small Chem/Bio Detection Technologies
62		Cyanide Pre-treatment System
63		Advanced Anticonvulsant
64		M17 Lightweight Decontamination System (LDS)
65		Joint Container Refilling System (JCRS)
66		Therapeutics Based on Common Mechanisms of Pathogenesis (DTO)
67		Autoinjector Delivery of Prompt Radiation Exposure Therepeutic
68		Chemical Agent Prophylaxes II (DTO)
69		Medical Countermeasures for Vesicant Agents (DTO)
70		JSLIST Block I Glove
71		Detection Technologies (Radar & Hyperspectral Imaging)
72		Reactive Topical Skin Protectant (DTO)
73		Vaccines, Bacterial
74		Vaccines, Viral
75		Chemical Point Detection
76		Ricin Vaccine
77		Theraputics, Toxin
78		Joint Protective Aircrew Ensemble (JPACE)

Note: Medical programs highlighted

FY01 NBC Defense Joint Priority List (cont.)

Rank		Program
79		Joint Service Aircrew Mask (JSAM)
80		Vaccines, Toxin
81		Protective Clothing (JSLIST/FFE/EOD)
82		NBC Medical Planning Tool (JNBCDST)
83		Detection of Contaminants on Surfaces
84		Joint Ground Effects Model (JGEM)
85		Vaccines, Toxin - SE
86		Advanced Lightweight Chemical Protection (DTO)
87		Multiagent Vaccines for Biological Threat Agents (DTO)
88		Aircrew Protective Mask (ACPM) (M45)
89		Modular Decontamination System (MDS)
90		Joint Chemical Ensemble (JCE)
91		Aircrew Eye Respiratory Protection (AERP)
92		Joint Service General Purpose Mask (JSGPM)
93		Medical Countermeasures for Brucella (DTO)
94		Medical Countermeasures for Encephalitis Viruses (DTO)
95		Shipboard Collective Protection System (CPS) Backfit Program (CPSBKFT)
96		Individual Protection
97		Combined Injury Therapeutic (Radiation/Biological, Radiation/Vesicant, Radiation/Nerve)
98		Enhanced Therapeutic for Prompt Radiation Exposure
99		Enzymatic Decontamination (DTO)
100		Novel Threats (Fourth Generation Nerve Agents)
101		Therapeutics - Target Sites for Neuroprotection
102		Pretreatments - Organophosphate Anhydrolase Catalytic Scavengers
103		Theraputics, Bacterial
104		Shipboard Collective Protection Equipment (SCPE)
105		Enhanced Therapeutic for Protracted Radiation Exposure
106		Therapeutics, Toxin - SE
107		Cytogenic-based Diagnostic Biodosimetry System
108		Common Diagnostic Systems for Biological Threats and Endemic Infectious Diseases (DTO)
109		Joint Collective Protection Equipment & Improvements (JCPE)
110		Chemistry and Toxoicology of Bioactive Compounds
111		Modeling and Simulation of CB Defense Equipment
112		Advanced Airborne RADIAC System
113		Joint Standoff RADIAC
114		Biological Dosimetry for Radiation Exposure
115		Pocket RADIAC AN/UDR-13
116		Therapeutics, Viral
117		Joint Transportable Collective Protection System (JTCOPS)

Note: Medical programs highlighted

FY01 NBC Defense Joint Priority List (cont.)

Rank		Program
118		Advanced NBC Casualty Transport System
119		Sorbent Decontamination System (SDS)
120		Collectively Protected Deployable Medical System (CPDEPMEDS)
121		Low-Level Chemical Agent Operational Studies
122		M28 Portable CP Shelters
123		Low-Level Chemical Warfare Agent Exposure
124		Medical Countermeasures Against Ionizing Radiation
125		Chronic Effects of CW Agent Exposure
126		Diagnostic Technologies
127		Nuclear Exposure Assessment Capability
128		Medical Doctrine
129		Modeling and Simulation of CB Environment
130		Continue Development of MODSIM Requirement Documentation
131		Chemical Biological Protective Shelter (CBPS) P3I
132		Non-Medical Training
133		Non-Medical Doctrine
134		Modeling and Simulation of Joint Operability
135		Medical Training

Note: Medical programs highlighted

APPENDIX B:

LEAD SERVICES AND REQUIREMENTS DOCUMENTS

Program	Acronym	Requirements Information		Rqts. Lead Service	Materiel Development Lead Service
Aircrew Mask Programs - Current (XM 45, CB Helo, AERP)	AMP-C	ORD	13-Sep-93	USA	USA
Automatic Chemical Agent Detector and Alarm	ACADA	JSOR	1-Nov-78	USA	USA
Biological Integrated Detection System	BIDS	ORD	9-Jul-93	USA	USA
Chem/Bio Radiological Integrated Detection System	CBRIDS	Proposed			
Joint Chemical Environment Survivability Suit	JCESS	ORD	22-Sep-97	SOF	TBD
Joint Chemical Environment Survivability Mask	JCESM	ORD	22-Sep-97	USAF	TBD
Improved Chemical Agent Monitor	ICAM	ROC	27-Jul-84	USA	USA
Improved (Chemical Agent) Point Detection System	IPDS	ORD	21-Sep-94	USN	USN
Interim Biological Agent Detector	IBAD	MNS	1-Aug-92	USN	USN
Joint Biological Point Detection System	JBPDS	JORD	23-Aug-96	USN	USA
Joint Biological Agent Identification and Diagnostic System	JBAIDS	ORD	Draft	USAF	TBD
Joint Biological Standoff Detection System	JBSDS	JORD	Draft	USA	USA
Joint Biological Tactical Detection System	JBTDS	JORD	Draft	USMC	TBD
Joint Container Refilling System	JCRS	ORD	Draft	USMC	TBD
Joint Chemical Agent Detector	JCAD	JORD	6-Jun-99	USAF	USAF
Joint Chemical/Biological Agent Water Monitor	JCBAWM	ORD	23-Oct-98	USAF	USA
Joint Collective Protection Equipment	JCPE	Various	Various	USN	USN
Joint Protective AirCrew Ensemble	JPACE	JORD	13-Apr-99	USAF	USN
Joint Service Aircrew Mask	JSAM	JORD	24-Aug-98	USN	USAF
Joint Service Chemical Warning and Identification LIDAR Detection (Artemis)	JSWILD				USN
Joint Service Fixed Site Decon (includes JADS & LWPDS)	JSFXD	JORD	Draft	USAF	USMC
Joint Service General Purpose Mask	JSGPM	JORD	21-Sep-98	USA	USA
Joint Service Lightweight Integrated Suit Technology	JSLIST	JORD	26-May-95	USMC	USMC
Joint Service Multispectral C/B Detector	JSMCBD	JORD	Draft	SOF	TBD
Joint Service Light NBC Reconnaissance System (includes CBMS)	JSLNBCRS	ORD	30-May-00	USMC	USMC
Joint Service Lightweight Standoff Chemical Agent Detector	JSLSCAD	JORD	16-Jun-97	USA	USA
Joint Service Mask Leakage Tester	JSMLT	ORD	29-Sep-99	USMC	TBD
Joint Service Sensitive Equipment Decon	JSSED	JORD	13-May-99	USAF	USA
Joint Transportable Collective Protection System	JTCOPS	JORD	Draft	USAF	USA
Joint Warning and Reporting Network (includes MICAD)	JWARN	JORD	10-Oct-97	USMC	USMC
Lightweight Decontamination System	LDS	MNS	27-Jul-93	USMC	USMC
M40A1 Series Mask	M40A1	JSOR	1-Apr-92	USA	USA
Modular Decontamination System	MDS	ORD	16-Jun-93	USA	USA
NBC Recon System SIP	NBCRS-SIP	ROC	22 Feb 91	USA	USA
NBC Unmanned Ground Vehicle System	NBC UGVS	Proposed		USA	TBD
Protection Assessment Test System (M41)	PATS	ORD	1-Feb-92	USA	USA
Scanning Airborne Emission for Gaseous Ultraspectral Analysis and Radiometric Detection	SAFEGUARD	Proposed			
Shipboard Automatic Liquid Agent Detector	SALAD	ORD	14-Jan-93	USN	USN
Shipboard Collective Protective Equipment	SHIP CPE	TEMP (OR)	1-Nov-92	USN	USN
Sorbent Decontamination System	SDS	ORD	22-Dec-99	USA	USA
Special Operations Modular Chem/Bio Detector	SOMCBD	ORD	22-Dec-97	SOF	
Chemical Biological Protective Shelter	CBPS	ORD	24-Jan-00	USA	USA

Program	Acronym	Requirements Information		Rqts. Lead Service	Materiel Development Lead Service
Chemical Medical Defense Programs					
Convulsant Antidote for Nerve Agents	CANA	JSOR	29-Nov-88	USA	USA
Cyanide Pretreatment	CP	ORD	14-Nov-95	USA	USA
Medical Aerosolized Nerve Agent Antidote	MANAA	JSOR	14-Feb-92	USA	USA
Med. Def. Against Chem/Bio Warfare Agents		MNS	24-Aug-94		
Multichambered Autoinjector	NAADS	ORD	15-Mar-99	USA	USA
Nerve Agent Pretreatment, Pryidostigmine	NAPP	ORD	15-Mar-99	USA	USA
Topical Skin Protectant	TSP	ORD	14-Nov-95	USA	USA
Biological Medical Defense Programs					
DoD Biological Defense		MNS	31-Aug-92		
Med. Def. Against Chem/Bio Warfare Agents		MNS	24-Aug-94		
Clostridium Botulinum Toxins Medical Defense System	CBT-MDS	ORD	16-Nov-98	USA	USA
Diagnostic Kit for Bio Warfare Agents	DKBWA	ORD	1-Aug-96	USA	USA
Next Generation Anthrax (NGA) Vaccine					
Q Fever Vaccine	CMR	ORD	14-Nov-95	USA	USA
Ricin Vaccine					
Smallpox Vaccine (cell cultured derived)		ORD	Jul-95	USA	USA
Staphylococcus Enterotoxin Vaccine					
Tularemia Live Vaccine		JSOR	20-Oct-88	USA	USA
Venezulean Equine Encephalitis Vaccines	VEE	ORD	May-95	USA	USA

APPENDIX C:

JOINT FUTURE OPERATIONAL CAPABILITIES (JFOCs)

Under the guidelines established by the NBC Defense Joint Service Agreement (JSA), dated August 1994, the Joint Service Integration Group (JSIG) has a primary responsibility for preparing the Joint Service NBC Defense Modernization Plan. This responsibility includes the coordination and the integration necessary for identifying near-term (now through FY07) Joint NBC operational requirements and far-term (FY07-FY25) Joint NBC operational needs.

In order to meet this far-term responsibility, the JSIG community, with support from decision analysis experts, developed a systematic process in FY97 by which Service non-medical NBC Defense Future Operational Capabilities (FOC) were identified and collated into a listing of Service agreed-upon NBC Defense JFOCs. Each of these top tier generic **Functional Capabilities** (FC) was subdivided into a set of more specified operational elements (**Major JFOCs**), each of which was further divided into a set of more defined operational capabilities (**Minor JFOCs**), thus forming a decision tree structure suitable for prioritization. A prioritization methodology, based upon the Analytic Hierarchy Process (AHP), was used to determine the extent that each of the JFOCs (at all tiers) contributes to the conduct of NBC operations as defined by the Joint NBC Defense Concept and as they address the predicted threat environment.

The resulting product was a JSIG approved prioritized listing of NBC Defense JFOCs that was published in a final report and distributed to the NBC Defense community in March 1998. Appendix C contains the latest approved listing of the medical and non-medical NBC Defense Joint Future Operational Capabilities (JFOCs) dated 1 November 2000.

JOINT FUNCTIONAL CAPABILITIES PRIORITIZATION

JOINT PRIORITY	CAPABILITY	ACRONYM
1	**BATTLE MANAGEMENT**	BATMGT
2	**CONTAMINATION AVOIDANCE**	CONAVOID
3	**INDIVIDUAL PROTECTION**	INDPROT
4	**RESTORATION CAPABILITY**	RESTORE
5	**COLLECTIVE PROTECTION**	COLPROT

JOINT MAJOR JFOC PRIORITIZATION

JOINT PRIORITY	CAPABILITY	ACRONYM
1	BatMgt - Battle Management Systems	BM-BS
2	ConAvoid - Biological Early Warning	CA-BE
3	BatMgt – Battle Analysis	BM-BA
4	ConAvoid – Chemical Early Warning	CA-CE
5	BatMgt – Modeling & Simulations Training	BM-MT
6	IndProt – Medical Prophylaxes	IP-MP
7	ConAvoid – Biological Point Detection	CA-BP
8	IndProt – Respiration & Percutaneous	IP- RP
9	ConAvoid – Medical Surveillance/Veterinary Support	CA-MV
10	ConAvoid – Chemical Point Detection	CA-CP
11	ConAvoid – Sensor Integration	CA-SI
12	Restore – Medical Diagnosis	RC-MD
13	ColProt – Mobile Applications	CP-MA
14	Restore – Medical Treatment	RC-TR
15	ConAvoid – Radiological Early Warning	CA-RE
16	Restore – Equipment/Facilities/Areas	RC-EL
17	Restore – Logistics	RC-LG
18	ColProt – Fixed Site Applications	CP-FS
19	ConAvoid – Radiological Point Detection	CA-RP
20	Restore – Personnel/Patient Decontamination	RC-PP

JOINT MINOR JFOC PRIORITIZATION

JOINT PRIORITY	CAPABILITY	Associated MAJOR
1	Provide real time visualization of NBC battlespace.	BM-BS
2	Interface NBC information with C4ISR and civil support capability.	BM-BS
3	Provide NBC analysis and planning tools for casualty estimation and medical/logistical support; hazards/effects; exposures; risk assessment; defense measures; and recommended courses of action.	BM-BA
4	Provide automated assimilation of information from all NBC defense assets.	BM-BS
5	Provide early warning detection capability for biological agents.	CA-BE
6	Provide capability to simulate battlespace NBC environments including complex and urban situations for planning and mission rehearsal, doctrine development and tactics-technique-procedures.	BM-BA
7	Provide capability to report and archive NBC exposures to individuals and forces.	BM-BS
8	Provide immune protection against all NBC agents.	IP-MP
9	Provide capability to simulate C4ISR and battlespace NBC environments for training and tactics-techniques-procedures.	BM-MT
10	Provide non-specific protective physiological enhancements against NBC agents.	IP-MP
11	Provide early warning identification capability for biological agents.	CA-BE
12	Protect NBC data from information warfare including unauthorized/unintentional intrusion.	BM-BS
13	Provide capability to harmonize service and interagency NBC countermeasures using a standardized common NBC characteristics and effects data set.	BM-BA
14	Provide unlimited NBC percutaneous and respiratory protection.	IP-RP
15	Provide early warning detection capability for chemical agents.	CA-CE
16	Provide immune protection tailorable to individual physiology.	IP-MP
17	Provide capability to simulate battlespace NBC environments to assess operational capability of materials and equipment.	BM-MT
18	Provide pretreatment for all NBC agents.	IP-MP

JOINT MINOR JFOC PRIORITIZATION (Continued)

JOINT PRIORITY	CAPABILITY	Associated MAJOR
19	Provide percutaneous and respiratory protection capability to interface with other individuals and combat equipment.	IP-RP
20	Provide capability to identify, track, and regulate NBC casualties.	BM-BS
21	Provide early warning identification for chemical agents.	CA-CE
22	Provide capability to detect/identify the presence of all biological agents.	CA-BP
23	Provide the capability for all NBC agent detection using a single interface.	CA-SI
24	Provide the capability to detect/identify the presence of all chemical agents.	CA-CP
25	Provide temporary NBC collective protection capability for mobile applications.	CP-MA
26	Provide capability to identify all NBC agents in clinical specimens.	CA-MV
27	Provide permanent NBC collective protection capability for mobile applications.	CP-MA
28	Provide deployable, rapid diagnostics for all NBC effects in humans and military working animals.	RC-MD
29	Provide deployable, rapid identification of NBC agents in food and water.	CA-MV
30	Provide capability to confirm and validate biological agent samples.	CA-BP
31	Provide capability to network with other non-NBC sensors.	CA-SI
32	Provide temporary NBC collective protection capability for fixed site applications.	CP-FS
33	Provide deployable, rapid measurement for all NBC exposures at all levels.	RC-MD
34	Provide capability to treat and remediate all NBC effects in humans and military working animals.	RC-TR
35	Provide capability to confirm and validate chemical agent samples.	CA-CP
36	Provide rapid and effective treatment at self, buddy and medical levels for NBC agents.	RC-TR
37	Provide permanent NBC collective protection capability for fixed site applications.	CP-FS
38	Provide early warning detection capability for radiological agents.	CA-RE

JOINT MINOR JFOC PRIORITIZATION (Continued)

JOINT PRIORITY	CAPABILITY	Associated MAJOR
39	Provide capability for medical risk assessment for all NBC exposures.	RC-MD
40	Provide capability to deliver continuous care to casualties in NBC environments.	RC-TR
41	Provide capability to manage and distribute medical/non-medical material for NBC Defense.	RC-LG
42	Provide a non-hazardous decontamination capability for use on sensitive equipment.	RC-EL
43	Provide a non-hazardous personnel decontamination capability.	RC-PP
44	Provide capability to sustain NBC defense assets during operations by reducing logistical footprint.	RC-LG
45	Provide a non-hazardous decontamination capability for use on non-sensitive equipment.	RC-EL
46	Provide capability to rapidly remove or neutralize all internal and external NBC contamination of casualties.	RC-PP
47	Provide capability to maintain protection for casualties during medical evacuation.	RC-TR
48	Provide a non-hazardous decontamination capability for use on facilities and areas.	RC-EL
49	Provide a decontamination capability with minimal impact on sustainment.	RC-EL
50	Provide capability to rapidly identify all internal and external NBC contamination of casualties.	RC-PP
51	Provide capability to detect/identify the presence of all radiological agents.	CA-RP
52	Ensure capability to rapidly produce new and existing NBC defense assets to meet operational requirements.	RC-LG
53	Provide early warning identification capability for radiological agents.	CA-RE
54	Provide capability to manage human remains in the NBC environment.	RC-LG
55	Provide capability to mange medical/non-medical waste in the NBC environment.	RC-LG
56	Provide capability to confirm and validate radiological agent samples.	CA-RP

APPENDIX D:

DEFENSE TECHNOLOGY OBJECTIVES (DTOs)

Chemical/Biological Defense (CBD)

Defense Technology Objectives (DTOs)

Combating Terrorism

Defense Technology Objectives (DTOs)

CB.07 *Laser Stand-off Chemical Detection Technology.*

Objectives. Demonstrate capability to detect agents at a distance of 20 km and evaluate sensitivity for "dusty" chemical agent detection.

Payoffs. This DTO will provide a stand-off laser detection technology for protection of fixed sites against chemical warfare agents, reconnaissance, and other battlefield applications; provide first-time ability for stand-off detection of chemical agent aerosols (particulates and liquid) and vapors in real time; and provide first-time capability for up to a 20 km range and precise ranging information.

Challenges. Demonstration of the existing laser stand-off chemical detector (LSCD) in joint service scenarios requires expansion of current azimuth and elevation scanning limits (low risk), and enhanced information display (low risk). Minimization of system response time will require upgrading to a real-time algorithm or display (low to moderate risk). Maximization of system ranges requires upgrading to a larger telescope (low risk) and higher-energy, tunable CO2 laser (moderate risk). The feasibility of adding improved mustard detection capabilities depends on developing and demonstrating 8-µm laser technology (high risk). The feasibility of adding dusty agent detection capabilities requires the characterization of optical properties of such particles (low to moderate risk) and modeling of LIDAR performance (low risk). In addition, substantiation of the theoretical analysis on dusty agent detection capabilities depends on the generation and testing of an appropriate simulant (moderate risk).

Milestones/Metrics.

FY2001: Demonstrate brassboard capabilities in field testing with sufficient laser power and detector sensitivity to detect chemical agents at a distance of 20 km (a 400% increase from the FY96 baseline); evaluate sensitivity for dusty chemical agent detection.

Customer POC	**Service/Agency POC**	**USD(AT&L) POC**
Lt. Col Leslie KOCH, USAF JSIG	Dr. Ngai WONG SBCCOM	Dr. Robert FOSTER ODUSD(S&T)/BioSystems Dr. Anna JOHNSON-WINEGAR DATSD(CBD)

CB.07 S&T Funding
(Dollar Amounts in Millions)

PE	Project	FY01	FY02	FY03	FY04	FY05	FY06	FY07
0603384BP	CB3	1.3	0.0	0.0	0.0	0.0	0.0	0.0
	DTO Total	**1.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

CB.08 ***Advanced Adsorbents for Protection Applications.***

Objectives. Develop advanced adsorbent bed materials and compositions (e.g., layered adsorbents) to enhance the chemical agent filtration capabilities of current single-pass filters and regenerative filtration systems under development; and reduce the size, weight, encumbrance, and cost of existing filtration systems.

Payoffs. Advanced adsorbent bed compositions for use in nuclear/biological/chemical (NBC) filters will result in smaller, lighter-weight filtration systems with reduced logistical requirements, improved protection against toxic industrial materials (TIMs), and reduced combustibility. Smaller, lighter-weight filters are especially desirable to address respirator needs for (1) improved face seal (less filter weight improves mask-to-face bond), and (2) improved weapons sighting (reduced filter size improves man-to-weapon interface). Development of noncombustible adsorbent beds is desirable to eliminate the possibility of a filter fire in the event of overheating resulting from malfunctioning of system components or exposure to exothermic materials. In FY99, adsorbent materials and combinations of materials exhibiting the desired properties and performance were prepared. An agent sorption assessment was initiated. In FY00, candidate impregnation formulations for several TIMs were identified, 25 adsorbent materials for desorption rate enhancement were screened, and large-pore silica materials were identified as most favorable for purge time reduction. Also, a study of nanotubes and dendrimeric materials as adsorbents was initiated.

Challenges. For single-pass filters, adsorbent beds that improve kinetics of agent removal are needed to address the goal of smaller, lighter-weight filters; also, specific impregnant formulations are needed owing to the diversity of the TIMs. For regenerable filters, adsorbent beds that readily release adsorbed agent during the purge cycle are needed to minimize size and energy requirements. The identification of noncombustible adsorbents with high levels of agent removal at all humidity conditions has proven to be an especially difficult challenge. Adsorbent bed compositions need to address recent approved requirements for NBC protection systems (e.g., Joint Service General Purpose Mask (JSGPM)), including capability for protection against TIMs, which is not adequately provided by current NBC filters.

Milestones/Metrics.

FY2000: Identify and validate impregnant formulations capable of addressing TIMs from the ITF-25 report "A list". Identify materials that will increase the purge rate for regenerative filtration systems by a factor of two. Assess material approaches to meet JTCOPS filtration requirements and identify most opportune system designs. Develop initial approaches to requirements and identify most opportune system designs. Develop initial approaches to address JSGPM performance envelope according to its performance and size requirements.

FY2001: Identify at least one adsorbent bed composition that requires at least 20% less volume than for 12 x 30 mesh ASZM-TEDA carbon in meeting the agent filtration requirements of JSGPM. For temperature swing adsorption (TSA) system development, identify at least one adsorbent bed composition that demonstrates at least a doubling of the rate of desorption over that provided by BPL carbon for 2-hexanol (simulant for agent GB).

FY2002: Modify ASZM-TEDA Carbon formulation to include minimum protection at the 40,000 mg-min/m3 Ct level for at least one of the five "hard-to-remove" threshold TICs for the JSGPM program. For TSA system development, identify a hydrophobic adsorbent bed composition offering a 25% reduction in energy required for regeneration in an 80% relative humidity environment.

FY2003: Identify at least one adsorbent bed composition that provides the level of protection required by the JCOPS program for all agents and at least 90% of the threshold TICs. Provide at least one adsorbent bed composition that provides for effective TSA system performance (at the level stated in JTCOPS requirements) for all chemical warfare agents and all high-priority TICs.

Customer POC	**Service/Agency POC**	**USD(AT&L) POC**
Lt. Col Leslie KOCH, USAF JSIG	Mr. Tony RAMEY NSWC-DD	Dr. Robert FOSTER ODUSD(S&T)/BioSystems Dr. Anna JOHNSON-WINEGAR DATSD(CBD)

CB.08 S&T Funding
(Dollar Amounts in Millions)

PE	Project	FY01	FY02	FY03	FY04	FY05	FY06	FY07
0602384BP	CB2	0.9	1.1	1.2	1.1	0.0	0.0	0.0
	DTO Total	**0.9**	**1.1**	**1.2**	**1.1**	**0.0**	**0.0**	**0.0**

CB.09 *Enzymatic Decontamination.*

Objectives. Develop and demonstrate a new generation of enzyme-based decontaminants that are nontoxic, noncorrosive, environmentally safe, and lightweight (freeze-dried concentrate).

Payoffs. Enzyme-based systems have the potential to reduce the logistical burden by 25- to 50-fold. High-activity G-agent enzymes have been identified, characterized, and demonstrated to be effective in NATO-sponsored agent trials. Several V-agent enzymes and H-agent reactive polymers have been identified, but their activity will need to be improved in order to reduce the quantities required. Enzyme-based materials may also have applications in some nonaqueous systems (sorbent, sensitive equipment decontamination) as well as personnel and casualty decontamination. Enzyme-based CW decontaminants can be mixed with a variety of naturally occurring and other mild biocidal materials to deal with BW agents as well. In FY99, enzymes for V- and H-agents were evaluated. Reactive polymers and other materials for enhanced H-agent hydrolysis/oxidation and compatibility with nerve agent enzymes were also evaluated. In FY00, enzyme activity against VX was increased 11-fold by site-directed mutagenesis and several new enzymes with V-agent activity identified. The production levels of recombinant G- and V-agent enzymes were increased significantly (3- to 5-fold).

Challenges. The major technical challenge is to identify appropriate enzymes and enzyme-compatible chemicals that are (1) reactive with all nerve and blister agents; (2) genetically engineered for large-scale production; and (3) nontoxic, noncorrosive, and environmentally safe.

Milestones/Metrics.

FY2001: Optimize formulations of V-agent enzymes and H-agent reactive materials for application in dispersion systems such as foams, detergent solutions, or other types of dispersion systems.

FY2002: Demonstrate the efficacy and stability of enzyme/chemical decontamination systems for G-, H-, and V-type agents in foams, detergent solutions, or other types of dispersions systems.

Customer POC	**Service/Agency POC**	**USD(AT&L) POC**
Lt. Col Leslie KOCH, USAF JSIG	Dr. John WEIMASTER SBCCOM	Dr. Robert FOSTER ODUSD(S&T)/BioSystems Dr. Anna JOHNSON-WINEGAR DATSD(CBD)

CB.09 S&T Funding
(Dollar Amounts in Millions)

PE	Project	FY01	FY02	FY03	FY04	FY05	FY06	FY07
0602384BP	CB2	0.8	0.9	0.0	0.0	0.0	0.0	0.0
	DTO Total	**0.8**	**0.9**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

CB.19 *Chemical Imaging Sensor.*

Objectives. Demonstrate a lightweight, wide-area, passive stand-off imaging detection system capable of rapidly detecting chemical agent vapors for the purpose of contamination avoidance, reconnaissance, and facilities evaluation. The final system will operate at 360 Hz with a 256 x 256 focal plane array (FPA), and is scheduled for transition to development in FY03. This DTO will focus on development of ultra-high-speed interferometers, integration of off-the-shelf FPAs, and development of a signal processing algorithm.

Payoffs. The chemical imaging sensor (CIS) will allow rapid evaluation of large areas for chemical warfare (CW) contamination, and provide detailed information as to the position of a CW agent cloud. Current single-pixel designs have an extremely limited field of view (typically 26 m at a distance of 1 km). In addition, they cannot scan at sufficient speeds for proposed high-speed applications (e.g., tactical helicopter, high-speed aircraft, and hemispherical scanning applications). The CIS will be capable of operating at fields of view at least 250 times greater than current systems. In addition, scan speeds will be increased by almost two orders of magnitude for extremely high-speed applications. The potential deployments include fixed sites, ground vehicles, unmanned aerial vehicles, helicopters, high and low aircraft, and even low-Earth-orbit configurations. In FY99, real-time operation at 30 Hz was demonstrated. In FY00, a 16-pixel spectrometer at 100 Hz with offline data processing was demonstrated.

Challenges. Proposed deployment of the CIS includes many ground and airborne scenarios that require high-speed operation. Speeds of at least 360 scans per second are required in many airborne operations in order not to "blur" the data. A significant effort is required to run an imaging spectrometer at these high speeds. The proposed spectrometer will contain (at the least) a low-density array of 9 to 16 pixels with higher density arrays being incorporated as they become available. The most significant current challenges are signal processing hardware and software, high-density FPA development, and high-speed interferometry. Commercially available interferometers typically operate at a few scans per second, with ten being a typical number. A CIS operating at 360 Hz with a 256 x 256 FPA will require about 1 TFLOP of computing power. Extrapolating current speed increases of high-speed computers into future signal processing hardware that can handle the CIS is expected to be available commercially in about 5 years.

Milestones/Metrics.

FY2001: Demonstrate real-time operation at 100 Hz.

FY2002: Demonstrate 16-pixel spectrometer at 360 Hz.

Customer POC	**Service/Agency POC**	**USD(AT&L) POC**
Lt. Col Leslie KOCH, USAF JSIG	Dr. Ngai WONG SBCCOM	Dr. Robert FOSTER ODUSD(S&T)/BioSystems Dr. Anna JOHNSON-WINEGAR DATSD(CBD)

CB.19 S&T Funding
(Dollar Amounts in Millions)

PE	Project	FY01	FY02	FY03	FY04	FY05	FY06	FY07
0602384BP	CB2	2.2	2.4	0.0	0.0	0.0	0.0	0.0
	DTO Total	**2.2**	**2.4**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

CB.20 *Biological Sample Preparation System for Biological Identification.*

Objectives. Develop and demonstrate an advanced, automated Biological Sample Preparation System (BSPS) for incorporation with genetic and mass spectrometric detection and identification systems. The BSPS represents an essential enabling technology for the success of these systems in field conditions. The final products of this effort are intended to transition as candidates to Joint Biological Point Detection System Block II.

Payoffs. When incorporated with genetic and mass spectrometric biological detection technologies, the technology being developed will expand the scope of detectable and identifiable biological agents, shorten the time required for sample analysis, ensure that a maximum and properly prepared sample load is analyzed, and reduce the associated logistics burden as well as overall footprint associated with these detection technologies. The development of these technologies will permit more rapid and reliable response at a lower overall implementation investment to biological threats on the battlefield as well as in applications related to domestic preparedness, intelligence gathering, and treaty verification issues. In FY99, methodologies to reduce time for disruption of spores and viral particles to 20 min at sensitivities corresponding to one agent-containing particle per liter air, as measured using DNA detection on gene probe sensors and protein biomarkers in mass spectrometry, were demonstrated. In FY00, construction of automated concept BSPS systems was initiated, with testing scheduled for Joint Field Trial-6 in Jan 2001.

Challenges. Specific ABO identification platforms requiring the development of this technology include gene probe sensors, which provide highly specific and sensitive detection, and biological mass spectrometry, which provides broad spectrum coverage. Major technical challenges include the removal of environmental/biological materials that may diminish performance of these platforms, rapid preconcentration of samples, rapid and efficient extraction of nucleic materials or proteins, automation of the entire sample treatment process to permit fully unattended operation, and the development and incorporation of microscale (MEMS-level) components where possible while maintaining overall sensitivity and response time.

Milestones/Metrics.

FY2001: Incorporate microscale approaches to reduce size of BSPS by 35% while maintaining overall sensitivity on both platforms against eight bacterial and viral materials for which assays and databases are being developed. Demonstrate reduction of detection time, including sample preparation time to 15 min.

Customer POC	**Service/Agency POC**	**USD(AT&L) POC**
Lt. Col Leslie KOCH, USAF JSIG	Dr. Randolph LONG SBCCOM	Dr. Robert FOSTER ODUSD(S&T)/BioSystems Dr. Anna JOHNSON-WINEGAR DATSD(CBD)

CB.20 S&T Funding
(Dollar Amounts in Millions)

PE	Project	FY01	FY02	FY03	FY04	FY05	FY06	FY07
0602384BP	CB2	2.8	0.0	0.0	0.0	0.0	0.0	0.0
	DTO Total	**2.8**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

CB.24 *Medical Countermeasures for Encephalitis Viruses.*

Objectives. Develop medical countermeasures against the biological warfare (BW) threat of the equine encephalitis viruses. Recombinant vaccine technology will be exploited to provide effective vaccine candidates.

Payoffs. Equine encephalitis viruses can cause disorientation, convulsions, paralysis, and death. They are important BW threats because of aerosol infectivity and relative stability. Clinical illnesses associated with Venezuelan, Eastern, and Western equine encephalitides (VEE, EEE, and WEE, respectively) include headaches, fever, chills, nausea, vomiting, mental confusion, sleepiness, and sometimes seizures and other neurological signs and symptoms. Mosquito vectors normally transmit these alphaviruses to birds, horses, and humans; however, alphaviruses are very stable when freeze-dried and have the potential to be used as a biological weapon. Safe and effective vaccines are needed to protect warfighters. Current vaccines for alphaviruses causing encephalitis are inadequate. For example, current vaccines do not provide protection across the full spectrum of VEE strains, and the VEE investigational vaccine has unacceptable adverse effects. Improved vaccines would decrease the threat of BW and enhance strategic mobility. Under this DTO, vaccine candidates for EEE and WEE analogous to a VEE vaccine have been constructed.

Challenges. Major technical challenges include development of appropriate animal model systems for investigational purposes, and determining expression vectors for recombinant products.

Milestones/Metrics.

FY2001: Complete safety and efficacy testing of VEE IE, VEE IIIA, EEE, and WEE in nonhuman primate models. Complete potency and stability studies on all vaccine candidates. Complete definition of surrogate protection markers.

FY2002: Complete formulation and vaccine interference studies. Transition VEE multivalent vaccine (VEE IA/B, VEE IE, VEE IIIA).

FY2003: Complete technical data package to support a Milestone 1 transition (advanced development). Transition combined VEE/EEE/WEE vaccine.

Customer POC	**Service/Agency POC**	**USD(AT&L) POC**
COL Helen S. TIERNAN, USA USAMEDD/C&S	Dr. Carol LINDEN, USA USAMRMC	Dr. Robert FOSTER ODUSD(S&T)/BioSystems Dr. Anna JOHNSON-WINEGAR DATSD(CBD)

CB.24 S&T Funding
(Dollar Amounts in Millions)

PE	Project	FY01	FY02	FY03	FY04	FY05	FY06	FY07
0602384BP	TB2	0.7	0.2	0.2	0.0	0.0	0.0	0.0
0603384BP	TB3	0.6	0.8	0.8	0.0	0.0	0.0	0.0
	DTO Total	**1.3**	**1.0**	**1.0**	**0.0**	**0.0**	**0.0**	**0.0**

CB.25 *Multiagent Vaccines for Biological Threat Agents.*

Objectives. Produce a vaccine or vaccine delivery approach that could be used to concurrently immunize an individual against a range of biological warfare (BW) threats. Bioengineered and recombinant vaccine technologies (naked DNA vaccines or replicon vaccines) will be exploited to achieve multivalent vaccines that are directed against multiple agents, yet use the same basic construct for all of the agents.

Payoffs. Vaccines currently being developed for biological threat agents are univalent with respect to the threat itself (e.g., separate vaccines against agents such as anthrax, plague, botulinum toxins, and smallpox). Multiagent vaccines to be demonstrated through this DTO would be analogous to such commercial vaccines as the combined diphtheria-pertussis-tetanus vaccine and the measles-mumps-rubella vaccine. The possibility of achieving protective immunity against multiple BW threat agents with a much reduced requirement for the number of vaccines or immunization schedules means greater flexibility and fewer time constraints in fielding a force protected against the threats. Another potential benefit includes decreased cost of production. Due to the nature of some of the threat agents and lack of commercial viability for such a combined product, there is no other commercial or foreign source through which to procure such products. In FY99, animal models were developed for evaluating single and potential combined vaccines.

Challenges. Major technical challenges include development of appropriate model systems for investigational purposes, and evaluation of immunogenicity, efficacy, and possible interference effects of a multiagent vaccine candidate.

Milestones/Metrics.

FY2001: Test efficacy of both individual and combined products.

FY2002: Demonstrate multiagent vaccine platform proof-of-principle with a vaccine delivery platform containing up to three vaccine components.

Customer POC	**Service/Agency POC**	**USD(AT&L) POC**
COL Helen S. TIERNAN, USA USAMEDD/C&S	Dr. Carol LINDEN, USA USAMRMC	Dr. Robert FOSTER ODUSD(S&T)/BioSystems Dr. Anna JOHNSON-WINEGAR DATSD(CBD)

CB.25 S&T Funding
(Dollar Amounts in Millions)

PE	Project	FY01	FY02	FY03	FY04	FY05	FY06	FY07
0602383E	BW-01	1.0	1.0	0.0	0.0	0.0	0.0	0.0
0602384BP	TB2	0.5	0.3	0.0	0.0	0.0	0.0	0.0
0603384BP	TB3	1.5	1.7	0.0	0.0	0.0	0.0	0.0
	DTO Total	**3.0**	**3.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

CB.26 *Common Diagnostic Systems for Biological Threats and Endemic Infectious Diseases.*

Objectives. Develop state-of-the-art technologies (platforms/devices) capable of diagnosing infectious disease and biological warfare (BW) agents in clinical specimens. The devices will be used by preventive medicine personnel for disease surveillance and monitoring, and by medical laboratory personnel for the diagnosis of disease due to natural and BW threat agents. Efforts will focus on an immunologically based membrane device to rapidly detect host immune responses to etiologic agents or the antigens or products of the agents themselves, and on miniaturized polymerase chain reaction technology for detection and identification of nucleic acids of natural infectious disease and BW agents.

Payoffs. The ability to quickly identify exposure to specific BW and infectious disease agents and rapidly treat warfighters is critical to maintaining the strength of the force and to giving commanders the ability to provide specific protective measures to yet unexposed warfighters. Many BW agent-induced illnesses have early symptoms that are flu-like and indistinguishable from each other and other less harmful pathogens. The ability to detect infection immediately after exposure would be extremely helpful in determining whether a BW attack has occurred and how many warfighters were exposed and in need of treatment. Early diagnosis is key to providing effective therapy. An effective broad diagnostic capability is important in locating the correct therapeutics and getting them moved in-theater in a timely manner. Collaborations with industrial/biotechnology entities, government, and academic centers of excellence will be developed to leverage continuing advances in biotechnology and industry. In FY99, an immunologically based membrane platform for malaria was transitioned to advanced development (program definition and risk reduction phase.) by the Military Infectious Disease Research Program.

Challenges. Requisite technologies require adaptation for clinical use and for detection of specific infectious disease or BW agents. Challenges include development of appropriate antibodies, elimination of interference from substances contained in clinical samples, and selection of appropriate nucleic acid probes. The diagnostic system must be able to distinguish these diverse pathogens both from each other and from those common natural infections that may begin with similar signs and symptoms. Current diagnostic systems also require manual sample collection and preparation, which is labor intensive and time consuming, especially when large numbers of clinical samples must be collected in the field.

Milestones/Metrics.

FY2001: Transition to concept exploration a portable device capable of detecting and identifying nucleic acids from a broad range of natural infectious and BW agents in clinical specimens.

FY2002: Transition to advanced development a portable device capable of detecting and identifying nucleic acids from a broad range of natural infectious diseases and BW agents in clinical specimens.

Customer POC	**Service/Agency POC**	**USD(AT&L) POC**
Dr. Alan RUDOLPH DARPA/DSO	COL Charles H. Jr. HOKE, USA USA/MRMC	Dr. Robert FOSTER ODUSD(S&T)/BioSystems
	Dr. Carol LINDEN, USA USAMRMC	Dr. Anna JOHNSON-WINEGAR DATSD(CBD)
	Dr. Alan RUDOLPH DARPA/DSO	

CB.26 ***Common Diagnostic Systems for Biological Threats and Endemic Infectious Diseases (cont.)***

CB.26 S&T Funding
(Dollar Amounts in Millions)

PE	Project	FY01	FY02	FY03	FY04	FY05	FY06	FY07
0602383E	BW-01	1.0	0.0	0.0	0.0	0.0	0.0	0.0
0602384BP	TB2	0.6	0.6	0.0	0.0	0.0	0.0	0.0
0603384BP	TB3	1.0	1.0	0.0	0.0	0.0	0.0	0.0
	DTO Total	**2.6**	**1.6**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

CB.27 *Therapeutics Based on Common Mechanisms of Pathogenesis.*

Objectives. Develop a suite of medical countermeasures against broad classes of biological pathogens (bacterial, viral, bioengineered, etc.) that share common mechanisms of pathogenesis.

Payoffs. Effective pathogen countermeasures may not eliminate the threat of biological warfare (BW) by a determined adversary, but they can provide a significant disincentive to its use. Program success will provide vaccine and therapeutic countermeasures that will reduce the threat of biological warfare and its operational impact through the development of new broad-spectrum antivirals and antibacterials. These will be particularly important for emerging and bioengineered threats for which there are no current countermeasures.

Challenges. The exploitation of modern genetic engineering by adversaries to develop ``super pathogens`` or to disguise agents is of concern. This emerging capability puts an even greater stress on our ability to detect and combat the medical consequences of exposure and infection. In addition, some potential operational environments could cause generalized immunosuppression, further increasing both the risk from biological threats and the need for robust immune defenses.

Milestones/Metrics.

FY2001: Develop novel therapeutics targeting the common pathways of pathogenesis.

FY2002: Demonstrate efficacy of candidate therapeutics in laboratory and animal models.

FY2003: Develop testing and evaluation architectures for operational force protection efficacy.

Customer POC	**Service/Agency POC**	**USD(AT&L) POC**
Dr. John CARNEY, DARPA DARPA/DSO	Dr. John CARNEY, DARPA DARPA/DSO	Dr. Robert FOSTER ODUSD(S&T)/BioSystems Dr. Anna JOHNSON-WINEGAR DATSD(CBD)

CB.27 S&T Funding
(Dollar Amounts in Millions)

PE	Project	FY01	FY02	FY03	FY04	FY05	FY06	FY07
0602383E	BW-01	30.0	25.0	12.0	0.0	0.0	0.0	0.0
	DTO Total	**30.0**	**25.0**	**12.0**	**0.0**	**0.0**	**0.0**	**0.0**

CB.28 *Chemical Agent Prophylaxes II.*

Objectives. Continue development (Phase 0) of a prophylactic that can detoxify nerve agents at a sufficient rate to protect the warfighter from exposure to up to five median lethal doses (5LD50) of nerve agents.

Payoffs. This technology objective would provide a capability for extended protection against a wide spectrum of nerve agents without causing side effects, behavioral effects, or the need for extensive post-exposure therapy. The successful application of this technology could reduce the reliance on mission-oriented protective posture gear by the warfighter.

Challenges. Major technical challenges include developing effective prophylactics devoid of side effects, developing circulating scavengers with extended half-lives, developing suitable animal models for these studies, producing sufficient material for safety and efficacy studies, and extrapolating efficacy test results from animals to man.

Milestones/Metrics.

FY2001: Complete the evaluation of human protein catalytic scavengers. Determine the 3D x-ray crystallographic structure of human CaE and PON-1. Determine through discussions with the FDA the type(s) of data required for submission with an Investigational New Drug application for a human recombinant catalytic protein.

FY2002: Complete development/validation of a transgenic animal model capable of producing sufficient amounts of recombinant enzyme scavenger material for clinical trials. Determine safety and efficacy of scavenger candidates in two animal species. Transition to Advanced Development a chemical warfare agent prophylactic that will protect the warfighter for a period greater than 8 hours against exposure to 5LD50 of nerve agent.

Customer POC	**Service/Agency POC**	**USD(AT&L) POC**
COL Helen S. TIERNAN, USA USAMEDD/C&S	Dr. Carol LINDEN, USA USAMRMC	Dr. Robert FOSTER ODUSD(S&T)/BioSystems Dr. Anna JOHNSON-WINEGAR DATSD(CBD)

CB.28 S&T Funding
(Dollar Amounts in Millions)

PE	Project	FY01	FY02	FY03	FY04	FY05	FY06	FY07
0602384BP	TC2	1.2	1.0	0.0	0.0	0.0	0.0	0.0
0603384BP	TC3	0.7	1.0	0.0	0.0	0.0	0.0	0.0
	DTO Total	**1.9**	**2.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

CB.29 *Active Topical Skin Protectant.*

Objectives. Increase the protection offered by the Skin Exposure Reduction Paste Against Chemical Warfare Agents (SERPACWA), the licensed topical skin protectant (TSP), by incorporating an active moiety that will neutralize nerve agents and sulfur mustard. This active moiety must be compatible with SERPACWA and not be irritating to the skin.

Payoffs. Nerve agents and sulfur mustard are significant threats to U.S. forces. While pretreatment and treatment compounds are available for nerve agents, no specific countermeasure has been developed for sulfur mustard. An active TSP would either augment the protection afforded by the protective overgarments or, ideally, redefine and reduce the circumstances requiring mission-oriented protective posture levels. The rapid action of sulfur mustard suggests that a pre-exposure skin protection system offers the best opportunity to prevent the serious consequences from percutaneous exposure to this agent. This approach also reduces the risks from skin exposure to nerve agents. An effective active TSP would deter the use of chemical agents by an enemy and increase the ability of U.S. and allied forces to sustain operational tempo.

Challenges. Major technical challenges include: (1) developing active moieties that are not irritating to the skin, (2) developing active moieties that are catalytic and not limited by stoichiometry, (3) developing suitable evaluation models, and (4) extrapolating efficacy test results from animals to humans.

Milestones/Metrics.

FY2001: Initiate efficacy studies of candidate active TSP formulations challenged with estimated battlefield levels of nerve agents and sulfur mustard as liquids or vapors in two animal species.

FY2002: Complete formulation studies. Perform acute eye and skin irritation safety evaluations. Complete efficacy studies of active TSP formulations challenged with estimated battlefield levels of nerve agents and sulfur mustard as liquids or vapors. Select best formulation candidate(s) for transition to development. Transition active TSP formulation(s) capable of protecting against anticipated battlefield levels of nerve agents and sulfur mustard with minimal adverse effects.

Customer POC	**Service/Agency POC**	**USD(AT&L) POC**
COL Helen S. TIERNAN, USA USAMEDD/C&S	Dr. Carol LINDEN, USA USAMRMC	Dr. Robert FOSTER ODUSD(S&T)/BioSystems Dr. Anna JOHNSON-WINEGAR DATSD(CBD)

CB.29 S&T Funding
(Dollar Amounts in Millions)

PE	Project	FY01	FY02	FY03	FY04	FY05	FY06	FY07
0603384BP	TC3	1.3	1.3	0.0	0.0	0.0	0.0	0.0
	DTO Total	**1.3**	**1.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

CB.30 *Medical Countermeasures for Vesicant Agents II.*

Objectives. Demonstrate a safe and effective pharmacological countermeasure to prevent or decrease by 80% the severity of blister injuries caused by vesicant chemical agents, focusing principally on sulfur mustard. Compounds or combinations of compounds will be evaluated against one another to determine the best therapy for transition to advanced development.

Payoffs. Currently, medical management of the injuries produced by blister agents is limited to immediate decontamination followed by conventional treatment of the resulting blisters or burns. This work will yield a vesicant agent countermeasure that will substantially reduce the degree of injury among exposed soldiers, with concomitant reductions in the medical logistic burden.

Challenges. Challenges include developing therapeutic measures with minimal adverse effects, demonstrating safety and efficacy, developing formulations, and extrapolating test results from animals to humans.

Milestones/Metrics.

FY2001: Determine in vivo efficacy of candidate therapies using two animal models. Initiate test(s) for safety. Begin downselect process.

FY2002: Determine the maximum time after sulfur mustard exposure that the therapy is still effective.

FY2003: Perform preclinical studies of selected candidate compounds (Milestone 1). Complete downselection. Transition candidate vesicant countermeasure to development (Milestone 1). Prepare Transition Information Package that addresses FDA Investigational New Drug requirements.

Customer POC	**Service/Agency POC**	**USD(AT&L) POC**
COL Helen S. TIERNAN, USA USAMEDD/C&S	Dr. Carol LINDEN, USA USAMRMC	Dr. Robert FOSTER ODUSD(S&T)/BioSystems Dr. Anna JOHNSON-WINEGAR DATSD(CBD)

CB.30 S&T Funding
(Dollar Amounts in Millions)

PE	Project	FY01	FY02	FY03	FY04	FY05	FY06	FY07
0602384BP	TC2	4.0	3.0	1.0	0.0	0.0	0.0	0.0
0603384BP	TC3	1.0	2.0	4.0	0.0	0.0	0.0	0.0
	DTO Total	**5.0**	**5.0**	**5.0**	**0.0**	**0.0**	**0.0**	**0.0**

CB.31 *Medical Countermeasures for Brucellae.*

Objectives. Develop medical countermeasures for Brucellae. Specifically, develop a genetically characterized live, attenuated vaccine that elicits cellular and humoral immunity against the four pathogenic species of Brucella and protects 90% of individuals against disease after aerosol challenge.

Payoffs. Brucella melitensis, B. abortus, and B. suis are closely related validated biological warfare threat agents that are highly infectious by aerosol and cause severely incapacitating illness. B. canis can also cause disease, but is less threatening. Protective strategies that rely on antibiotic prophylaxis or treatment may not be adequate: a multi-drug resistant strain of B. abortus is known to exist. Live attenuated vaccines have proven highly successful in controlling brucellosis in livestock, but none is suitable for human testing. A candidate live, attenuated vaccine developed by USAMRMC between 1993 and 1999 is attenuated in mice and non-human primates (NHP) and highly efficacious in a pulmonary challenge model in mice. A vaccine that is efficacious against aerosol challenge in NHPs should protect humans against infection with all pathogenic species of Brucella. Such a vaccine would benefit warfighters at risk of exposure to this biological threat agent. Additionally, a live, attenuated Brucella vaccine may have future value as a vector to deliver antigens to protect against a number of biological threat agents.

Challenges. Major technical challenges include defining the most appropriate in vitro correlates of protective immunity and defining the best criteria for demonstration of efficacy. The approach to resolving challenges and determining if the vaccine candidate(s) result in stated payoffs involves ongoing testing in animal models and assessment of humoral and cellular immune responses in response to specific Brucellae antigens.

Milestones/Metrics.

FY2001: Determine B. melitensis aerosol lethality; determine relative efficacy of vaccine candidates in NHP challenge model using B. melitensis; establish fermentation conditions for live, attenuated vaccine strain; prepare seed stocks.

FY2002: Test most efficacious vaccine candidate(s) from FY2001 studies against B. canis, B. abortus and B. suis, perform pre-IND animal studies with pilot lot of candidate vaccine.

FY2003: Test candidate vaccine pilot lot in NHP aerosol challenge model for protective efficacy against all four pathogenic species of Brucella; prepare technical data package to support Milestone 1 transition and FDA's Investigational New Drug (IND) process.

Customer POC	**Service/Agency POC**	**USD(AT&L) POC**
COL Helen S. TIERNAN, USA USAMEDD/C&S	Dr. Carol LINDEN, USA USAMRMC	Dr. Robert FOSTER ODUSD(S&T)/BioSystems Dr. Anna JOHNSON-WINEGAR DATSD(CBD)

CB.31 S&T Funding
(Dollar Amounts in Millions)

PE	Project	FY01	FY02	FY03	FY04	FY05	FY06	FY07
0602384BP	TB2	0.4	0.4	0.4	0.0	0.0	0.0	0.0
0603384BP	TB3	1.4	1.6	1.7	0.0	0.0	0.0	0.0
	DTO Total	**1.8**	**2.0**	**2.1**	**0.0**	**0.0**	**0.0**	**0.0**

CB.32 ***Needle-less Delivery Methods for Recombinant Protein Vaccines.***

Objectives. Develop alternatives to the injection of recombinant protein-based vaccines that result in mucosal and systemic immunity to these agents.

Payoffs. Significant mortality and morbidity are associated with inhalation exposure to threat agents such as staphylococcal enterotoxins (SE), Bacillus anthracis (anthrax), and Yersinia pestis (plague). Protection against lethality is considered a minimal requirement of a medical countermeasure. Recombinant proteins that have been used as vaccine antigens are available for each of these agents and studies in rhesus monkeys demonstrate the parenterally administered vaccines are effective against an inhalational challenge. SEs are also incapacitants in human subjects. Although parenterally administered SE vaccine candidates protected rhesus monkeys from lethal SE type B challenges, a number of the animals experienced incapacitating signs after toxin challenge. Existing data suggest mucosal and systemic immunity are required to prevent lethality as well as incapacitation caused by SE exposure. Mice immunized intranasally with SE vaccines were protected from inhalation and intraperitoneal toxin challenges and demonstrated levels of mucosal antibodies significantly higher than in mice immunized intramuscularly. A mucosal respiratory immune response may improve vaccine efficacy by providing immunity at the portal of agent entry. Potential CRADA partners have been identified that can share expertise in technologies for delivery of biological factors. This will facilitate rapid transition of candidate products. Needle-less administration of vaccines avoids health risks involved with the use of needles. Intranasal, transdermal, inhalation, or oral immunization strategies may be safer and more efficacious methods for stimulating mucosal and systemic immunity. These strategies will be useful for the administration of a significant number of vaccines currently planned to obtain total force protection.

Challenges. Major technical challenges include defining quantifiable immunological end-points indicative of protection, producing stable vaccine formulations, selecting practical and efficacious route(s) of administration, and protecting vaccinated individuals from lethal and incapacitating toxin challenges.

Milestones/Metrics.

FY2001: Establish protocols and framework for studies. Identify/standardize assays to quantitate toxin-specific antibodies/other indicators of immunity. Identify commercial or proprietary devices for vaccine delivery. Standardize animal models.

FY2002: Optimize system components. Define relationships between toxin-specific antibodies/other indicators of immunity. Determine optimal mode of vaccine delivery. Evaluate formulations for intranasal/inhalation and transdermal application.

FY2003: Demonstrate efficacy of needle-less monovalent vaccines. Propose formulations for intranasal/inhalation and transdermal delivery. Conduct baseline studies in animal models.

FY2004: Demonstrate efficacy of needle-less combination vaccines. Propose formulations of combination vaccines for intranasal/inhalation and transdermal delivery. Conduct baseline studies of combination vaccines in animal models.

FY2005: Complete studies required supporting product transition. Demonstrate proof of concept and complete technical data package to support a Milestone 1 transition.

Customer POC	**Service/Agency POC**	**USD(AT&L) POC**
COL Helen S. TIERNAN, USA USAMEDD/C&S	Dr. Carol LINDEN, USA USAMRMC	Dr. Robert FOSTER ODUSD(S&T)/BioSystems Dr. Anna JOHNSON-WINEGAR DATSD(CBD)

CB.32 ***Needle-less Delivery Methods for Recombinant Protein Vaccines (cont.)***

CB.32 S&T Funding
(Dollar Amounts in Millions)

PE	Project	FY01	FY02	FY03	FY04	FY05	FY06	FY07
0602384BP	TB2	0.6	0.6	0.6	0.0	0.0	0.0	0.0
0603384BP	TB3	0.9	1.2	1.1	1.7	1.7	0.0	0.0
	DTO Total	**1.5**	**1.8**	**1.7**	**1.7**	**1.7**	**0.0**	**0.0**

CB.33 *Recombinant Protective Antigen Anthrax Vaccine Candidate.*

Objectives. Characterize (biochemically and immunologically) a recombinant protective antigen (rPA) anthrax vaccine, including preliminary development of an appropriate in vitro correlate of PA-induced protective immunity against Bacillus anthracis aerosol exposure.

Payoffs. This vaccine candidate should facilitate the characterization of the major protective component of Anthrax Vaccine Absorbed (AVA) and will provide the basis for a next generation anthrax vaccine suitable for licensure by the FDA. Preliminary efficacy experiments in a rabbit model have already demonstrated that protection is afforded by rPA produced from either B. anthracis or E. coli. To date, an in vitro correlate in humans to vaccine-induced immunity against anthrax does not exist. Circulating anti-PA antibody from mice, rabbits, or monkeys can be evaluated as a surrogate marker for efficacy by passive immunization followed by aerosol challenge, to determine if the animals are protected. Demonstrating proof-of-concept for anti-PA antibody as a surrogate marker should facilitate development of an assay for predicting protective immunity in humans after immunization with rPA. Definition of a surrogate marker will facilitate FDA licensure of the vaccine candidate.

Challenges. Challenges are to expand animal efficacy studies comparing AVA with rPA, and demonstrate surrogate efficacy against B. anthracis aerosol challenge with antibody to rPA alone.

Milestones/Metrics.

FY2001: Perform comparative biochemical/biophysical characterization of rPA and AVA; perform comparative efficacy studies in animal models with rPA with AVA; conduct rPA- and AVA-immune passive transfer studies with homologous sera in mice and rabbits, and complete technical data package supporting a Milestone 1 transition.

FY2002: Evaluate efficacy of rPA in non-human primates; perform passive transfer studies with human sera (AVA) in mice and rabbits; initiate study employing human sera passively transferred to monkeys.

Customer POC	**Service/Agency POC**	**USD(AT&L) POC**
COL Helen S. TIERNAN, USA USAMEDD/C&S	Dr. Carol LINDEN, USA USAMRMC	Dr. Robert FOSTER ODUSD(S&T)/BioSystems Dr. Anna JOHNSON-WINEGAR DATSD(CBD)

CB.33 S&T Funding
(Dollar Amounts in Millions)

PE	Project	FY01	FY02	FY03	FY04	FY05	FY06	FY07
0602384BP	TB2	0.5	0.5	0.0	0.0	0.0	0.0	0.0
0603384BP	TB3	0.8	1.5	0.0	0.0	0.0	0.0	0.0
	DTO Total	**1.3**	**2.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

CB.34 *Recombinant Plague Vaccine.*

Objectives. Complete the pre-clinical development of the recombinant F1-V fusion protein plague vaccine candidate.

Payoffs. Infection induced by inhalation of Yersinia pestis represents a serious biological warfare threat. The resultant disease, pneumonic plague, is associated with an incubation period of 2–5 days and an untreated mortality of nearly 100% within 1–3 days after onset of illness. The previously licensed plague vaccine is no longer available and provides poor protection against aerosolized Y. pestis. The recombinant F1-V fusion protein has shown excellent protection against aerosolized Y. pestis in rodents and partial protection in a preliminary non-human primate (NHP) study. Additional preclinical studies in animals will be required to define optimal dosing schedules, long-term immunogenicity, and duration of protection. Additionally, in vitro correlates of protective immunity must be established for FDA licensure. A strong correlate of immunity with an associated assay could potentially replace older animal-based efficacy testing for vaccine potency. The vaccine candidate should also be assessed against a variety of strains of virulent Y. pestis. Well-established mouse and non-human primate aerosol models will facilitate completion of these goals. An effective FDA-licensed vaccine against aerosolized plague will enhance force protection and strategic mobility.

Challenges. Major technical challenges include identification of the most appropriate in vitro correlates of protective immunity against aerosolized plague, establishment of a surrogate efficacy model for F1-V immunity, and the time required to assess the duration of protection offered by the F1-V vaccine candidate.

Milestones/Metrics.

FY2001: Complete studies and activities associated with Phase 0 Exit Criteria and complete a technical data package to support a Milestone 1 transition.

FY2002: Continue expanded animal studies for immunogenicity and efficacy including the evaluation of long-term immunity in NHPs; continue to optimize formulation and determine the range of protection of the vaccine candidate against other virulent strains of Y. pestis.

Customer POC	**Service/Agency POC**	**USD(AT&L) POC**
COL Helen S. TIERNAN, USA USAMEDD/C&S	Dr. Carol LINDEN, USA USAMRMC	Dr. Robert FOSTER ODUSD(S&T)/BioSystems Dr. Anna JOHNSON-WINEGAR DATSD(CBD)

CB.34 S&T Funding
(Dollar Amounts in Millions)

PE	Project	FY01	FY02	FY03	FY04	FY05	FY06	FY07
0602384BP	TB2	0.2	0.2	0.0	0.0	0.0	0.0	0.0
0603384BP	TB3	0.7	0.9	0.0	0.0	0.0	0.0	0.0
	DTO Total	**0.9**	**1.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

CB.35 *Stand-off Biological Aerosol Detection.*

Objectives. Develop and demonstrate technology by the end of FY04 for an advanced, wide-area, stand-off biological detection capability to both detect and discriminate biological aerosol clouds at operationally significant concentrations.

Payoffs. The development of this technology would permit the rapid detection, discrimination, and location of biological aerosol clouds. This technology would also be capable of being used on various platforms for the purpose of air or ground biological reconnaissance and contamination avoidance. Technology developed under this effort is intended to address operational requirements of the Joint Biological Stand-off Detection System, for which essential target parameters are a range (threshold) of 25 km, sensitivity (threshold) of 15 agent-containing particles per liter of air (ACPLA), and real-time detection.

Challenges. Significant progress has been made recently in both active and passive stand-off detection arenas with respect to biological detection. Despite this, significant challenges remain. In addition to size, weight, and power, challenges exist with respect to both sensitivity and specificity leading to hybrid technology concepts (use of two or more technologies) for the final system design.

Milestones/Metrics.

FY2001: Identify potential technology solutions to the biological stand-off challenge and sources of data relevant to assessing these solutions. Collect or develop technical information on potential system performance, define quantitative metrics, and identify potential use concepts. This objective will be accomplished by using expertise from the user community (via JSIG), the materiel developer community (JPO-BD, JSMG), and internal and external technical experts (e.g. DoD, DOE, academia, and industry).

FY2002: Coordinate with JSIG to establish system performance parameters (e.g., required range, detection time) and conduct downselection among potential technology solutions based on weighted criteria. Downselect will be supported by experimental investigations to develop requisite fundamental data to validate the potential of top-ranked technologies and to identify strengths and weaknesses of the top-rated technologies against quantitative metrics identified in FY01.

FY2003: Construct and characterize breadboards based on the results of the downselect and user input. Evaluate final breadboards via field test (extends to FY04).

FY2004: Optimize overall system performance based on field test results and demonstrate against Milestone 0 metrics. Transition to advanced development.

Customer POC	**Service/Agency POC**	**USD(AT&L) POC**
Lt. Col Leslie KOCH, USAF JSIG	Dr. Randolph LONG SBCCOM	Dr. Robert FOSTER ODUSD(S&T)/BioSystems Dr. Anna JOHNSON-WINEGAR DATSD(CBD)

CB.35 S&T Funding
(Dollar Amounts in Millions)

PE	Project	FY01	FY02	FY03	FY04	FY05	FY06	FY07
0602384BP	CB2	0.2	1.8	3.5	3.4	0.0	0.0	0.0
	DTO Total	**0.2**	**1.8**	**3.5**	**3.4**	**0.0**	**0.0**	**0.0**

CB.36 *Universal End-of-Service-Life Indicator for NBC Mask Filters.*

Objectives. Develop a low-cost, universal end-of-service-life indicator (ESLI) for use in NBC protective mask filters that will indicate the presence of a broad range of chemical warfare agents and toxic industrial chemical vapors/gases. This will be achieved through an extensive technology survey, identifying best candidate solutions, developing an ESLI design concept, and demonstrating the efficacy of the design concept with target challenge agents.

Payoffs. Presently there are no means to determine the residual life of fielded filters. Development of a universal ESLI will greatly enhance serviceman safety by alerting the user to replace the filter before its gas life capacity has expired. Other benefits include reduced cost and logistical burden since current change-out doctrine is conservative and results in the premature replacement and excess stockpiling of filters in the field. This DTO addresses a desired requirement for the Joint Service General Purpose Mask. The technology developed will also have direct application to commercial respirator filters used in the workplace. A universal ESLI will have valuable dual-use application as a residual life indicator for collective protection filters and chemical protective clothing used in the military and industry for protection against hazardous industrial vapors/gases.

Challenges. Development of a "universal" colorimetric ESLI to detect such a wide range of contaminants is considered moderate to high risk. Although state-of-the-art passive technologies such as colorimetric indicators exist for detecting specific contaminants, most rely on specific reaction chemistry and, thus, are not suitable as universal (e.g., multi-contaminant) indicators. Realistically no single indicator is expected to achieve such nonspecificity; however, it is feasible that a combination of different nonspecific colorimetric indicator technologies could be used to target key organic vapor and acid gas contaminants of concern. This DTO will focus on passive indicator technologies capable of detecting a select range of key chemical warfare and toxic industrial agents.

Milestones/Metrics.

FY2001: Identify best candidate passive indicator technologies for organic vapor and acid gas contaminant. Conduct initial screening evaluations; optimize indicator formulation to enhance response; select best candidate ESLI approaches for each application.

FY2002: Develop baseline data characterizing the performance of the most promising ESLI technologies. Assess performance parameters such as reaction time, range of detection, and effects of temperature and humidity using carbon bed test cells; select best candidate technologies based on baseline data.

FY2003: Incorporate best candidate technologies into viable ESLI mask filter prototypes. ESLI prototypes will be evaluated with modified military or commercial mask filters using a variety of representative contaminant challenges; enhance design and determine optimum location of ESLI.

FY2004: Conduct demonstration testing of ESLI filter prototype(s) to validate achievement of performance goals. Demonstrate ESLI design prototype(s) that is effective against a select range of organic vapor/acid gas chemical warfare and toxic industrial agents and capable of indicating when 80 +/- 10% of the filter gas life capacity is depleted. Assessments will include determining the effects of common environmental factors (heat, humidity, ozone, etc.) that may impact ESLI performance and evaluating the effects of rough handling and long-term storage.

Customer POC	**Service/Agency POC**	**USD(AT&L) POC**
Lt. Col Leslie KOCH, USAF JSIG	Mr. Tony RAMEY NSWC-DD	Dr. Robert FOSTER ODUSD(S&T)/BioSystems Dr. Anna JOHNSON-WINEGAR DATSD(CBD)

CB.36 S&T Funding
(Dollar Amounts in Millions)

PE	Project	FY01	FY02	FY03	FY04	FY05	FY06	FY07
0602384BP	CB2	0.7	0.8	0.6	0.6	0.0	0.0	0.0
	DTO Total	**0.7**	**0.8**	**0.6**	**0.6**	**0.0**	**0.0**	**0.0**

CB.37 Joint *CB Agent Water Monitor.*

Objectives. Develop system concepts and technologies to meet the service requirement for a Joint Chemical Biological Agent Water Monitor. The desired capability is for the detection and identification of hazardous chemical and biological agents in potable water. The system will be capable of processing both source (ponds, lakes, rivers, etc.) and treated water (purified and distribution systems). It is unlikely that a single technology will be able meet this objective. Therefore, the system will most likely consist of two or more integrated technologies that have been optimized to meet a specific challenge.

Payoffs. The only system currently fielded for the detection of agents in water is the M272 Water Test Kit. This kit has several drawbacks, including an inability to detect biological agents and a relatively long response time. This kit is difficult to use when in a protective posture and is incapable of autonomous operation, requiring a user to interpret the results. The water monitor developed in this effort will be capable of detecting both chemical and biological agents. In addition, it will be capable of real-time, autonomous operation, which will allow the system to be used as a true water monitor.

Challenges. The challenges associated with this DTO are numerous. The system will be required to operate under a variety of environmental conditions, ranging from extremely turbid source water to chemically treated "clean" water. Experience shows that this will pose a significant challenge in terms of both agent sensitivity and specificity. The system will also be required to operate in near real time (less than ten minutes). While this may or may not be a significant factor for chemical agents, it is extremely challenging for biological agents. Current biological detection technologies rely on analytical techniques, which range in processing times from hours to days. Sensitivity requirements also pose a significant challenge. In addition, an understanding of the actual threat in water is not clear. Chemical agents, for instance, undergo chemical changes in water much more quickly than in air. Factor such as hydrolysis will be significant. Biological agents will no doubt undergo changes as well, making the detection problem somewhat dynamic.

Milestones/Metrics.

FY2001: Complete design of integrated CB water monitor based on the most mature technology currently available using an open architecture to ensure that new and improved technology can be used to update the overall system with minimal effort. Develop test protocols for testing system. Develop transition plan for Milestone 0 decision.

FY2002: Complete the construction of initial breadboard. Complete testing to identify shortfalls.

Customer POC	**Service/Agency POC**	**USD(AT&L) POC**
Lt. Col Leslie KOCH, USAF JSIG	Dr. Ngai WONG SBCCOM	Dr. Robert FOSTER ODUSD(S&T)/BioSystems Dr. Anna JOHNSON-WINEGAR DATSD(CBD)

CB.37 S&T Funding
(Dollar Amounts in Millions)

PE	Project	FY01	FY02	FY03	FY04	FY05	FY06	FY07
0602384BP	CB2	1.3	2.0	0.0	0.0	0.0	0.0	0.0
	DTO Total	**1.3**	**2.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

CB.38 *Activity-Based Detection and Diagnostics.*

Objectives. Demonstrate engineering of cells and tissues that is directed toward the development of activity detection systems for biological and chemical threats, and develop metrics for system performance in detection applications to include environmental sensing and advanced diagnostics for critical defense needs.

Payoffs. The successful demonstration of cell and tissue activity detection systems could provide dramatic new capabilities for sensing the activity of existing, emerging, and engineered biological and chemical warfare threats or hazards. These detection systems could also be used as monitors for toxins related to operational exposures in deployment toxicology and could provide rapid surveillance tools for epidemiologic surveillance of environmental or medical samples. Successful demonstration of cell- and tissue-based detection systems could also be used as high-throughput screening tools for drug discovery.

Challenges. The program approach is based on robust extraction of cell and tissue signatures of agent response. The first task will focus on the generation of these signatures and the use of pattern recognition tools to robustly extract signatures of activity and response. This task will also include the reduction of critical risk parameters associated with the design and fabrication of working prototype cell- or tissue-based activity detectors. These include sample collection and preparation, extended cell and tissue performance and shelf life, optimized fluidics, and data acquisition and analysis tools. The second task is dedicated to testing and validating the system prototypes that include hand-held and small footprint benchtop systems. The most significant issues that must be addressed are: (1) Cell/Tissue Response and System Prototype Development--populate library of key cell and tissue responses to chemical and biological agents of interest to DoD that could be monitored in environmental and diagnostic samples; demonstrate extended performance of cells and tissues to enable the recording of agent response for an operationally relevant timeframe (21days); and develop a sample collection and preparation module suitable for cell and tissue detector systems threats; (2) System Testing and Validation--incorporate cell/tissue signatures into prototype systems; test and validate prototype detection systems; and develop metrics for specific operational use.

Milestones/Metrics.

FY2001: Transfer specific cell- and tissue-based assays to existing detection systems.

FY2002: Define critical parameters of tissue reactors. Demonstrate 21-day performance. Develop data acquisition and analysis tools. Develop sample collection and preparation module. Develop metrics for cell- and tissue-based system. Test and validate working cell- and tissue-based prototypes.

FY2003: Define trigger detection system application for working detection system. Demonstrate stable tissue reactor system. Demonstrate dry storage stability.

Customer POC	**Service/Agency POC**	**USD(AT&L) POC**
Brig Gen Klaus O. SCHAFER, USAF, HQ USAF/SGX	Dr. Alan RUDOLPH DARPA/DSO	Dr. Robert FOSTER ODUSD(S&T)/BioSystems Dr. Anna JOHNSON-WINEGAR DATSD(CBD)

CB.38 S&T Funding
(Dollar Amounts in Millions)

PE	Project	FY01	FY02	FY03	FY04	FY05	FY06	FY07
0602383E	BW-01	27.0	20.0	20.0	0.0	0.0	0.0	0.0
	DTO Total	**27.0**	**20.0**	**20.0**	**0.0**	**0.0**	**0.0**	**0.0**

CB.39 *CW/BW Agent Screening and Analysis.*

Objectives. Provide the technology required to meet DoD requirements under CWC and BWC: (1) Agent and Byproduct Extraction--effectively and rapidly isolate of target compounds from treaty-obtained environmental samples; (2) Agent and Byproduct Screening Technology--develop hand-held real-time, simple-to-operate screening methods for field operations; (3) Agent and Byproduct Determinative Analysis--increase equipment throughput and speed, improve instrument portability and ruggedness, and develop target compound-specific instrumentation not otherwise required by industry; and (4) Remote and Nondestructive Evaluation Techniques--develop highly portable, noninvasive interrogation methods for agents and byproducts within containers of all shapes and configurations.

Payoffs. This DTO promotes national security and protect confidential business information while implementing arms control treaties in the most cost-effective manner. Current technologies and infrastructure are not timely and sufficiently cost effective to protect U.S. equities.

Challenges. Current technology equipment size, portability, and detection limits do not meet the desires of U.S. policy makers. These technologies must also be developed in such a manner that ITAR requirements and reciprocity concerns are alleviated.

Milestones/Metrics.

FY2001: Develop new hand-held sensor technologies specific to CW degradation products. Assess and explore proof of concept for BW hand-held detector technologies.

FY2002: Deploy test versions of Advanced NDE Analysis System and two hand-held systems. Produce study on extraction and analysis of biological materials for field use.

FY2003: Finish development of portable, miniaturized BW detection system based on agent virulence. Field test biological tissue detection assays for BW and CW.

FY2004: Explore CW detection limits in the parts-per-billion range with hand-portable equipment in complex matrices (soil, water, air, and biological samples). New BW technologies will be developed to speed detection of virulence, bioactivity, and dispersion in real time.

FY2005: Complete prototype of NDE system for analysis of chemical mixtures.

FY2006: Complete V.5 of the OPCW sample preparation method for GC Mass Spec analysis.

Customer POC	**Service/Agency POC**	**USD(AT&L) POC**
Mr. Dirk WYCHOFF DTRA/OSAC	Ms. Cathleen HOEFLER DTRA/TDC	Dr. Robert FOSTER ODUSD(S&T)/BioSystems Dr. Anna JOHNSON-WINEGAR DATSD(CBD)

CB.39 S&T Funding
(Dollar Amounts in Millions)

PE	Project	FY01	FY02	FY03	FY04	FY05	FY06	FY07
0603711BR	BI	11.5	11.4	12.2	12.4	12.8	12.9	0.0
	DTO Total	**11.5**	**11.4**	**12.2**	**12.4**	**12.8**	**12.9**	**0.0**

CB.40 *Immune Building Program.*

Objectives. Develop and demonstrate technologies and systems to allow military buildings to actively respond to attack by agents of chemical or biological warfare so as to (1) protect the human occupants from the lethal effects of the agent, (2) restore the building to function quickly after the attack, and (3) preserve forensic evidence about the attack.

Payoffs. Enabling buildings to respond actively, in real time, to the presence of threat agents will not only greatly reduce the effectiveness of such attacks, but will also make the buildings less attractive as targets.

Challenges. These objectives will be achieved through a mix of passive and active modifications and augmentations to building infrastructure. ``Passive`` modifications are those in use continually and include, for example, highly efficient filtration; ``active`` augmentations are those used only in the presence of the threat and include real-time control of airflow or real-time neutralization of aerosolized agent. Active response requires networked surveillance systems. Such systems require the development of a number of component technologies in areas like filtration, neutralization, and decontamination. In addition, the implementation of a complex system of this type requires that a number of systems-level issues be resolved, including the design, implementation, and optimization of systems architectures. As proof that all issues have been appropriately addressed, the program will conclude with a full-scale demonstration of a functioning system at a military installation.

Milestones/Metrics.

FY2001: Design of full-scale testbed for testing systems architectures.

FY2002: Buildout and implementation of testbed and installation of components necessary to implement building protection.

FY2003: Evaluation of strategies and architectures in full-scale testbed. Results lead to design and optimization of complete building protection systems.

FY2004: System design and optimization for demonstration at a military installation.

FY2005: Full-scale demonstration at military installation.

Customer POC	**Service/Agency POC**	**USD(AT&L) POC**
Dr. Amy ALVING DARPA/SPO	Dr. Amy ALVING DARPA/SPO	Dr. Robert FOSTER ODUSD(S&T)/BioSystems Dr. Anna JOHNSON-WINEGAR DATSD(CBD)

CB.40 S&T Funding
(Dollar Amounts in Millions)

PE	Project	FY01	FY02	FY03	FY04	FY05	FY06	FY07
0602383E	BW-01	10.0	19.0	25.0	24.0	5.0	0.0	0.0
	DTO Total	**10.0**	**19.0**	**25.0**	**24.0**	**5.0**	**0.0**	**0.0**

CB.41 *Biological Warfare Defense Sensor Program.*

Objectives. Develop a fully integrated, well-characterized sensor system for the effective real-time detection of biological warfare (BW) agents to enable pre-exposure detection and discrimination.

Payoffs. This DTO will provide military personnel with advanced warning of specific active exposure to BW agents, and an ``all clear`` assessment after the use of appropriate decontamination/neutralization countermeasures.

Challenges. The critical challenge is to produce sensor systems that are sufficiently fast and selective to permit an accurate low-false-alarm, high-probability-of-detection decision to be made in a sufficiently timely manner to permit proactive protection of military personnel. To accomplish this task, the fabrication of the first-generation automated time-of-flight mass spectrometer and its characterization for a limited number of BW agents and backgrounds will be completed in FY01. In FY02, the characterization will be extended to more species and strains of threat agents, and the optimization of the system to minimize the false-alarm rate will be investigated.

Milestones/Metrics.

FY2001: Complete detailed characterization of the biological agent's time of flight (BioTOF) for BW agent detection against a key threat agent from each class: spore, virus, toxin and vegetative cell.

FY2002: Complete detailed characterization of the BioTOF, including (1)an extended evaluation of false alarms, (2) an evaluation of selectivity against sub-species of threats, and (3) an evaluation of novel chemical agent threats.

Customer POC	**Service/Agency POC**	**USD(AT&L) POC**
Dr. Steve BUCHSBAUM, DARPA DARPA/SPO	Dr. Steve BUCHSBAUM, DARPA DARPA/SPO	Dr. Robert FOSTER ODUSD(S&T)/BioSystems Dr. Anna JOHNSON-WINEGAR DATSD(CBD)

CB.41 S&T Funding
(Dollar Amounts in Millions)

PE	Project	FY01	FY02	FY03	FY04	FY05	FY06	FY07
0602383E	BW-01	8.0	7.0	0.0	0.0	0.0	0.0	0.0
	DTO Total	**8.0**	**7.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

L.01 *Vehicle Entry Point Screening.*

Objectives. Develop improved capabilities for detecting improvised explosive devices (IEDs) of at least 100 pounds and chemical threat materials in vehicles ranging in size from passenger cars up to large tractor-trailers and tanker trucks; maintain the stream of commerce throughput of vehicles; and decrease the number of personnel manning the entry point.

Payoffs. Improved detection capabilities at entry points located away from personnel concentrations will significantly reduce terrorists' ability to cause mass casualties using large vehicle bombs. Application of current and emerging technology will enable improved detection while simultaneously reducing the number and increasing the safety of entry point personnel. This DTO will leverage the progress achieved by the U.S. Customs Service and the DoD Counter Drug Technology Development program by adopting their illicit substance detection technology for the detection of explosives.

Challenges. No single detection technology, either current or emerging, constitutes a complete detection capability. The challenge is to use a system approach to integrate complementary detection technologies into an effective and easily used tool. Candidate technologies include bulk imaging systems (e.g., x-ray, gamma ray), trace detection systems (e.g., ion mass spectrometry, quadrupole resonance, computed tomography) and vision systems. Since security personnel currently are not specifically trained in the complicated analysis of the data that these complex sensors provide, an additional challenge will be to develop automatic detection algorithms that give reliable warnings to minimally trained operators. In order to provide adequate vehicle screening without unduly impacting traffic flow through the entry point, profiling strategies, such as license plate readers and biometrics, are required to focus detailed inspection efforts on only the most probable terrorist vehicles. Finally, a portable version of this system approach must be made available to DoD expeditionary-type forces for use at forward-deployed field sights.

Milestones/Metrics.

FY2001: Demonstrate a mobile gamma-ray imaging system that can detect a 100-lb IED within 3 minutes. Establish metrics to define acceptable vehicle throughput and false-alarm rates (FARs). Demonstrate a vehicle inspection checklist that will improve the ability of force protection personnel to detect IEDs.

FY2002: Demonstrate a partially integrated modular entry-point screening system that can detect a 50-lb IED in vehicles. Determine optimum number of operators for mobile vehicle inspection systems.

FY2003: Demonstrate an entry point screening system that is capable of employing multiple sensors, including a radiological detector. Assess current vehicle throughput to establish metrics for increasing throughput by 10% and reducing FAR by 20%. Demonstrate automatic detection algorithms.

FY2004: Demonstrate an integrated, modular entry-point screening system that includes IED and radiological detection capabilities and vehicle throughput.

FY2005: Demonstrate a fully integrated, modular system capable of detecting multiple threat agents with less than a 5% FAR and an acceptable vehicle throughput.

Customer POC	**Service/Agency POC**	**USD(AT&L) POC**
LTC Deborah LEWIS, USA JCS, J34	Mr. Jeffrey DAVID OST	Mr. Robert BOYD DUSD(S&T)Biosystems
Mr. Leo TARGOSCZ NCIS	Mr. John REINGRUBER OSD/SOLIC	
LTC Tim WEATHERSBEE, USA USEUCOM/ESCM		

L.01 S&T Funding
(Dollar Amounts in Millions)

PE	Project	FY01	FY02	FY03	FY04	FY05	FY06	FY07
0603122D	P484	1.5	2.9	1.4	1.0	0.9	0.0	0.0
	DTO Total	**1.5**	**2.9**	**1.4**	**1.0**	**0.9**	**0.0**	**0.0**

L.03 ***National Infrastructure Protection.***

Objectives. Develop and demonstrate advanced capabilities for defining and mapping critical elements of our national infrastructure, as defined by the President's Commission on Critical Infrastructure Protection; identify and characterize potential vulnerabilities, threats, and risks to critical elements of our national infrastructure; and analyze specific infrastructure elements and their interdependencies.

Payoffs. The potential vulnerability of critical elements of the national infrastructure to terrorist attack will be reduced, and the consequences of such attacks will be mitigated. New capabilities pertinent to infrastructure analysis and protection will enable more reliable impact assessments, improved risk analyses, timely threat support, implementation of robust protective measures, and improved contingency planning operations. This DTO will define specifications and standards and provide a model for other segments of the national infrastructure.

Challenges. New data search engines must be developed to assimilate and link disparate databases and data from a wide variety of sources to support the definition, identification, and mapping of infrastructure systems. An analysis methodology for identifying critical interdependencies across infrastructure elements must be devised. Credible analytical means for characterizing potential threats to infrastructure systems must be identified. Complex new tools are needed for automatically detecting, reporting, characterizing, and responding to attacks on information systems and networks via electronic means.

Milestones/Metrics.

FY2001: Demonstrate specific weaknesses of various infrastructure elements using automated vulnerability analysis and risk assessment tools.

FY2002: Demonstrate software tools for detecting cyber attacks on the nation’s critical infrastructure networks. Demonstrate a system that is capable of indicating the nature and complexity of the attack.

Customer POC	**Service/Agency POC**	**USD(AT&L) POC**
LTC Deborah LEWIS, USA JCS, J34	Mr. John REINGRUBER OSD/SOLIC	Mr. Robert BOYD DUSD(S&T)Biosystems
	Ms. Martha SNYDERWINE, USAF CTTSO	

L.03 S&T Funding
(Dollar Amounts in Millions)

PE	Project	FY01	FY02	FY03	FY04	FY05	FY06	FY07
0603122D	P484	17.0	0.6	0.0	0.0	0.0	0.0	0.0
	DTO Total	**17.0**	**0.6**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

L.04 *Stand-off Detection of Nitrogen-Based Explosives.*

Objectives. Develop advanced techniques and specialized equipment for stand-off detection and characterization of nitrogen-based explosive compositions. Approaches for detecting both solid and vapor phases of explosives contained in noncooperative vehicles will be explored.

Payoffs. Improved detection capabilities will enable covert examination of automobiles and trucks that might be involved in the transport of explosives. Such capabilities will also facilitate the more rapid inspection of cargo at various transport nodes and storage locations. Stand-off threat detection will (1) contribute to improved capabilities for perimeter security, and (2) enhance protection of critical military and civilian facilities and personnel against terrorist attack. This effort will contribute to and leverage related developments supported under DTO L.01 Vehicle Entry Point Screening, which focuses on entry point screening of cooperative vehicles.

Challenges. Techniques based on ultraviolet fluorescence, IR reflection, and neutron excitation require advances in signal processing to minimize false alarms and increase detection sensitivity. Demonstration of mobile operation will require lighter and more compact systems that can fit within a surveillance vehicle.

Milestones/Metrics.

FY2001: Demonstrate the ability to detect explosive vapors from a stand-off distance of at least 5 feet. Demonstrate the ability to detect explosive residue deposited on a target surface from a stand-off distance of at least 5 feet.

FY2002: Demonstrate the ability to detect explosive vapors from a stand-off distance of at least 10 feet. Demonstrate the ability to detect explosive residue deposited on a target surface from a stand-off distance of at least 10 feet.

FY2003: Demonstrate the ability to detect concealed explosive materials in excess of 100 pounds at a distance greater than 20 feet in less than 2 minutes with a false-alarm rate of less than 10%.

FY2004: Demonstrate the ability to detect concealed explosive materials in excess of 100 pounds at a distance greater than 50 feet in less than 1 minutes with a false-alarm rate of less than 10%.

Customer POC	**Service/Agency POC**	**USD(AT&L) POC**
LTC Deborah LEWIS, USA JCS, J34	Mr. John REINGRUBER OSD/SOLIC	Mr. Robert BOYD DUSD(S&T)Biosystems
	Mr. Jonathan SPERKA CTTSO	Mr. John REINGRUBER OSD/SOLIC

L.04 S&T Funding
(Dollar Amounts in Millions)

PE	Project	FY01	FY02	FY03	FY04	FY05	FY06	FY07
0603122D	P484	0.9	1.5	1.1	0.1	0.0	0.0	0.0
	DTO Total	**0.9**	**1.5**	**1.1**	**0.1**	**0.0**	**0.0**	**0.0**

L.04 Non-S&T Funding
(Dollar Amounts in Millions)

PE	Project	FY01	FY02	FY03	FY04	FY05	FY06	FY07
Foreign S&T	None	0.5	0.0	0.0	0.0	0.0	0.0	0.0
	DTO Total	**0.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

L.05 *Diagnostic Analysis of Improvised Explosive Devices.*

Objectives. Develop new equipment and systems that will enable explosive ordnance disposal (EOD) teams to analyze large vehicle bombs (LVBs) and other improvised explosive devices (IEDs).

Payoffs. Improved detection and diagnostic capabilities will enable more effective use of precision disruption techniques for a wide range of IEDs. Overall capabilities for protecting personnel, facilities, and elements of the national infrastructure subject to terrorist attack will be enhanced.

Challenges. The problems presented by most IED threats are time-urgent and require bomb technicians to work in a hazardous environment. Both new and improved diagnostic and disablement techniques that can be executed rapidly must be developed. Both new and improved diagnostics and techniques that can be executed rapidly must be developed. This requires advances in x-ray imaging technology, neutron interrogation, and diagnostic tools.

Milestones/Metrics.

FY2001: Demonstrate an IED diagnostic system that is capable of being deployed against a suspect package in tight noncooperative positions. Demonstrate a capability to detect and identify explosive compounds remotely and nonintrusively in IEDs with a probability of detection of at least 80% and a false-alarm rate less than 10%.

FY2002: Demonstrate a capability to detect and identify explosive compounds remotely and nonintrusively in IEDs with a probability of detection of at least 90% and a false-alarm rate less than 5%.

FY2003: Demonstrate capability to detect antihandling devices (booby traps) associated with IEDs.

FY2004: Demonstrate ability to determine status of electronic circuits in IEDs in real time.

Customer POC	**Service/Agency POC**	**USD(AT&L) POC**
LTC Deborah LEWIS, USA JCS, J34	Mr. John REINGRUBER OSD/SOLIC Mr. Jonathan SPERKA CTTSO	Mr. Robert BOYD DUSD(S&T)Biosystems

L.05 S&T Funding
(Dollar Amounts in Millions)

PE	Project	FY01	FY02	FY03	FY04	FY05	FY06	FY07
0603122D	P484	1.1	1.6	1.0	0.8	0.0	0.0	0.0
	DTO Total	**1.1**	**1.6**	**1.0**	**0.8**	**0.0**	**0.0**	**0.0**

L.06 *Mitigation of Terrorist Attacks on Key Facilities.*

Objectives. Develop new techniques and vulnerability assessment tools for shock and damage mitigation in structures, and develop advanced building design and refortification methods. The program will focus on reducing blast debris hazards (the major cause of injury to personnel) and preventing structural collapse (the major cause of fatalities). Design methods for both new facilities and retrofits to existing structures will be developed.

Payoffs. New capabilities for mitigating blast effects will reduce injuries and fatalities in facilities subjected to terrorist attack, and expedite rescue and recovery operations. Validated structural protection and response models will be provided. As these technologies are developed, they will be incorporated into enhanced versions of the Antiterrorist Planner software program and be available for use in other force protection software to be used by field commanders, force protection planners, and assessment teams. During FY00, window and wall retrofit methods were developed, tested, and implemented into DoD buildings. A glass hazard prediction code (HAZL) was developed and distributed. Commercial window products were tested and evaluated for their effectiveness in reducing debris hazards. Column seismic retrofit techniques were adapted to resist blast and were successfully tested. Methods for retrofitting load-bearing masonry walls were developed and validated with blast tests. This effort supports the DTOs in the Military Operations in Urbanized Terrain and the Joint Readiness and Logistics and Sustainment of Strategic Systems JWCOs.

Challenges. The development of accurate, practical models for predicting blast effects for a wide range of structure types and designs is a difficult task. Required models need to be created as modules for incorporation into complex computational vulnerability assessment and building design tools. Other challenges include the development of architecturally acceptable blast mitigation building design and refortification features that are affordable and easy to install and that rely on readily available materials.

Milestones/Metrics.

FY2001: Demonstrate new methods and establish construction criteria for reducing fatalities due to progressive structural collapse in flat slab structures.

FY2002: Provide enhanced version of Antiterrorist Planner software.

FY2003: Develop methods for designing retrofits for existing buildings that reduce required blast stand-off distances by 40%.

FY2005: Demonstrate resistance to blast damage of buildings designed using new methodologies and improved materials for construction/retrofit.

Customer POC	**Service/Agency POC**	**USD(AT&L) POC**
LTC Deborah LEWIS, USA JCS, J34	Mr. Jeffrey DAVID OST	Mr. Robert BOYD DUSD(S&T)Biosystems
LTC Tim WEATHERSBEE, USA USEUCOM/ESCM	Dr. Richard JONES NFES	
	Mr. John REINGRUBER OSD/SOLIC	
	Mr. Douglas SUNSHINE DTRA/SW	
	Mr. Douglas WEHRING CEMRO/ED/ST	

L.06 S&T Funding
(Dollar Amounts in Millions)

PE	Project	FY01	FY02	FY03	FY04	FY05	FY06	FY07
0602784A	T40	1.0	1.0	0.0	0.0	0.0	0.0	0.0
0603122D	P484	11.2	12.0	10.0	10.0	8.0	0.0	0.0
	DTO Total	**12.2**	**13.0**	**10.0**	**10.0**	**8.0**	**0.0**	**0.0**

L.07 *Terrorist Chemical/Biological Countermeasures.*

Objectives. Develop effective countermeasures for detecting and identifying chemical/biological (CB) agents and toxic industrial chemicals (TICs) deployed in terrorist weapons.

Payoffs. The development of enhanced countermeasures will improve the capabilities of military and civilian units responding to terrorist threat incidents.

Challenges. Key challenges include the development of lightweight systems to detect and identify a wide range of CB and TIC threats in an urban environment while overcoming system complexity, operability, and affordability issues, and the development of systems capable of stand-off nonintrusive detection and identification of improvised terrorist devices containing CB threats.

Milestones/Metrics.

FY2001: Demonstrate lightweight (30% weight reduction) chemical point detector in the laboratory with capability to detect and identify a wide range of chemical threat agents and priority TIC threat agents. Demonstrate enhanced aerogel-based biological agent sample collection capability.

FY2002: Demonstrate enhanced aerogel-based chemical agent sample collection capability. Demonstrate in the laboratory a hand-held chemical point detector with the capability to reliably detect and quantify chemical warfare agents and selected TICS at levels below Immediate Dangerously to Life and Health (IDLH). Publish surface sampling strategy and guidelines for the detection and identification of biological agent for a commercial building environment.

FY2003: Demonstrate in the field lightweight chemical detection systems having less than a 2% false-alarm rate and the capability of detecting a wide range of terrorist threat agents in urban environments at levels below IDLH.

Customer POC	**Service/Agency POC**	**USD(AT&L) POC**
LTC Christopher HUGHES, USA JCS, J34	Ms. Tracy CRONIN CTTSO	Dr. Robert FOSTER ODUSD(S&T)/BioSystems
	Lt Col David R. LEWIS, USAF DTRA/SWP	
	Mr. John REINGRUBER OSD/SOLIC	

L.07 S&T Funding
(Dollar Amounts in Millions)

PE	Project	FY01	FY02	FY03	FY04	FY05	FY06	FY07
0603122D	P484	3.8	0.4	0.2	0.0	0.0	0.0	0.0
	DTO Total	**3.8**	**0.4**	**0.2**	**0.0**	**0.0**	**0.0**	**0.0**

L.12 *Force Medical Protection/Dosimeter ACTD.*

Objectives. Develop an individually worn environmental sampler that can continuously measure and archive chemical and biological agent exposures. Phase I development will emphasize passive collection and archiving of chemical agent exposures and non-real-time chemical analysis. Phase II development will emphasize real-time alarming for chemical agent exposures and individual, active collection and archiving of biological agents for non-real-time analysis. An extensive concept of operations (CONOPS) encompassing diverse operational forces and scenarios will also be developed.

Payoffs. Improved detection and identification capabilities will provide greater awareness of immediate chemical exposure risk and more precise identification of exposures across a boarder range of agents. The architecture for routine monitoring and analysis will improve risk assessments and record keeping. Additional payoffs will include the communication of exposure information to command centers and increased battlefield awareness and intelligence. This ACTD leverages activities in the Terrorist Chemical/Biological Countermeasures program and DARPA efforts in pathogen detection/identification.

Challenges. Specific challenges include developing technologies to collect, analyze, and differentiate between agents, interferents, and naturally occurring compounds; and improving selectivity and sensitivity to agents. Providing communications capabilities and real-time alarm while reducing size and weight will require advances in sampling methods, chemical analysis techniques, and electronics. Developing a CONOPS to include use of a sampler will require modeling, experimentation, and field testing to improve capabilities and increase utility.

Milestones/Metrics.

FY2001: Deliver residual capability to selected units for further user testing and development.

FY2002: Conclude interim capability support period.

Customer POC	**Service/Agency POC**	**USD(AT&L) POC**
LTC Christopher HUGHES, USA JCS, J34	Mr. Doug BRYCE MARCORSYSCOM/CSSLE	Mr. Joe EASH DUSD/AS&C
	Mr. John REINGRUBER OSD/SOLIC	Mr. Larry GOODELL DUSD/AS&C
		Mr. Jeff PAUL ODUSD(S&T)/SS

L.12 S&T Funding
(Dollar Amounts in Millions)

PE	Project	FY01	FY02	FY03	FY04	FY05	FY06	FY07
0603384BP	CB3	2.0	0.0	0.0	0.0	0.0	0.0	0.0
0603750D	P523	0.1	0.1	0.0	0.0	0.0	0.0	0.0
	DTO Total	**2.1**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

L.13 *Migration Defense Intelligence Threat Data System ACTD.*

Objectives. Provide the information infrastructure required for day-to-day situation awareness intelligence in support of combating terrorism (CbT) and force protection (FP) operations. The ACTD will upgrade Migration Defense Intelligence Threat Data System (MDITDS) software with advanced intranet applications to enhance the existing online virtual database of terrorism worldwide threat assessments and to interface to data repository on inspections of DoD facilities and interests. MDITDS will provide the intelligence data repository and a portal to access, evaluate, and disseminate this information.

Payoffs. MDITDS is the DoD intelligence information management system and data repository for force protection and threat analysis/warning. The system is intended to provide worldwide sharing of assessment data (ease of use), cooperative analysis within and across communities of interest (producer–consumer interaction), direct relationship of workflow activities with decision making (shortest route from producer to consumer), and the development and retention of the corporate knowledge base. MDITDS will focus on enhanced situational awareness for the protection of DoD personnel, resources, and facilities; increased deterrence against terrorist attacks; and improved response capability.

Challenges. Management of the high change in intranet technologies (e.g., Java class libraries) must be accomplished in order to provide a coherent and current software development and integration effort. The dependence on DoD communications infrastructure for data dissemination must be addressed to reduce risk, particularly in field-deployed situations with only tenuous or intermittent communications pathways.

Milestones/Metrics.

FY2001: Install and demonstrate vulnerability assessment, threat summary, and auto data tagging at EUCOM. The collection interface will also be field demonstrated and evaluated.

FY2002: Sustain the deployable server suite, based on field input from FY01 demonstration experiment for transition.

Customer POC	**Service/Agency POC**	**USD(AT&L) POC**
Mr. Stephen SPEARS EUCOM	Mr. Mike SKIBA DIA	Dr. Judith A. DALY DUSD/AS&C

L.13 S&T Funding
(Dollar Amounts in Millions)

PE	Project	FY01	FY02	FY03	FY04	FY05	FY06	FY07
0603750D	P523	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	DTO Total	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

L.13 Non-S&T Funding
(Dollar Amounts in Millions)

PE	Project	FY01	FY02	FY03	FY04	FY05	FY06	FY07
0301301L	None	1.2	1.2	0.0	0.0	0.0	0.0	0.0
	DTO Total	**1.2**	**1.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

L.14 *Coastal Area Protection System ACTD.*

Objectives. Demonstrate the feasibility of deploying technologies in the coastal/littoral areas for force protection. The system demonstrations will consist of technologies to support the surveillance, identification, and exclusion of threats in the vicinity of ports and harbors. The goal of Coastal Area Protection System (CAPS) is to provide a rapid capability to the U.S. Navy, U.S. Marine Corps, and U.S. Army prepositioning ships, as well as a fly-away capability for contingency operations.

Payoffs. The potential for CAPS to narrow, and possibly eliminate, the current littoral risk may significantly reduce waterborne threats in each of the combatant commands. CAPS provides for improved force protection by integrating sea, air, and land protection assets, while reducing force protection costs and manpower needs.

Challenges. To improve the timeliness of responsiveness to potential and actual threat and to achieve and maintain the flexibility to customize the system configuration for different regional requirements.

Milestones/Metrics.

FY2001: Execute and complete the total CAPS program.

Customer POC	**Service/Agency POC**	**USD(AT&L) POC**
Mr. Leo TARGOSCZ NCIS	Mr. Dave DEMARTINO NAVSEA	Mr. Alex LOVETT DUSD/AS&C

L.14 S&T Funding
(Dollar Amounts in Millions)

PE	Project	FY01	FY02	FY03	FY04	FY05	FY06	FY07
0603750D	P523	0.8	0.0	0.0	0.0	0.0	0.0	0.0
	DTO Total	**0.8**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

APPENDIX E:

DEVELOPMENT AND PROCUREMENT DESCRIPTIVE SUMMARIES (SMART CHARTS)

(FY02 President's Budget)

APPENDIX E TABLE OF CONTENTS

I. CONTAMINATION AVOIDANCE

II. JOINT BIOLOGICAL DEFENSE PROGRAM

III. INDIVIDUAL PROTECTION

IV. COLLECTIVE PROTECTION

V. DECONTAMINATION

VI. MEDICAL BIOLOGICAL DEFENSE DEVELOPMENT

VII. MEDICAL CHEMICAL AND BIOLOGICAL DEFENSE RESEARCH

VIII. TECHNOLOGY BASE NON-MEDICAL

IX. COUNTERPROLIFERATION SUPPORT

X. MANAGEMENT

ARTEMIS - ACTIVE STANDOFF CW DETECTION SYSTEM

UNCLASSIFIED

System Description

MISSION

- Provide standoff chemical agent detection of threat vapors, aerosols and rains; and identify current and emerging Chemical Warfare (CW) agents, Toxic Industrial Chemicals (TIC) and Bio/Non-Bio aerosols. Anticipated configuration/platforms: fixed sites, ships, ground mobile, and possibly aircraft.

CHARACTERISTICS/DESCRIPTION

- Active laser stand-off protection up to 20 km or more
- Automated, real-time operation and reporting
- Mounts at fixed sites, on ships, ground mobile and potentially air platforms
- Provides CB warning and reporting information for the digitized battlefield (JWARN)
- Single, integrated system protects entire site (airbase, port, high-value asset) or ship

CAPABILITY/IMPROVEMENTS

- First-time ability to provide stand-off CB detection of aerosols/rains/particulates/liquids
- First-time ability to provide up to 20 km or more range and precise ranging information
- First-time prediction of surface contamination
- Provides early warning and rapid recovery capabilities for fixed sites and ships
- Enables warfighter to take contamination avoidance measures

SPECIAL FEATURES

- Detects all forms of nerve and blister agents
- Also provides early warning of bio agents
- No operator
- 360 degree projection
- High probability of detection
- Programmable to detect new/novel threats

CONTRACTORS

- TBD

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE											
PROC											
TOTAL											
QTY											

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE			2.9	8.7	8.7	8.5	16.1	18.8			63.7
PROC									8.1	Cont.	Cont.
TOTAL			2.9	8.7	8.7	8.5	16.1	18.8	8.1	Cont.	Cont.
QTY									26	Cont.	Cont.
PGM Chg			2.9	8.7	8.7	8.5	16.1	18.8	8.1		

Notes

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 543
Joint Acq Objective: 543
QTY Through FY07: 26

O&O/ORD

Unit	ORG	QTY

Fielding

- TBD

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	None
Program Acq Cost	None
Quantity	None

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	63.7
Procurement	8.1
Total Program	71.8

Current Status

- **DOD POSITION**
  - Joint program strongly supported for its stand-off, integrated chemical agent detection/identification/alarm and biological agent early warning capabilities. This system has been ranked #3 in the Joint Future Operational Capabilities Assessment (JFOC) by the warfighter.
- **FIELDING**
  - Army/Navy/USAF/USMC fielding for FY09.
- **QUANTITY** - N/A
- **PROCUREMENT**
  - Procurement initiated in FY07.
- **FMS**
  - N/A
- **MODIFICATIONS**
  - N/A
- **ISSUES**
  - None

ARTEMIS - ACTIVE STANDOFF CW DETECTION SYSTEM

UNCLASSIFIED

1 FEB 2001
SAAL-ZCS PAUL LANGE (703) 604-7245
DAMO-FDB COL IZZO (703) 695-3089

Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE							
Proc							
Total							

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

SASC: Mr. Joe Sixeas
- No Language

SAC-D: Mr. John Young
- No Language

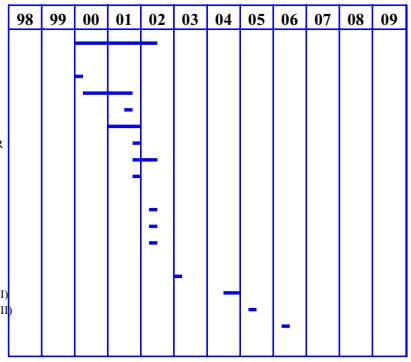
Conf
- No Language

Conf
- No Language

Notes

Schedule

Overflowed



ACADA - AUTOMATIC CHEMICAL AGENT DETECTOR AND ALARM

UNCLASSIFIED

1 FEB 2001
SAAL-ZCS PAUL LANGE (703) 604-7245
DAMO-FDB COL IZZO (703) 695-3089

System Description

MISSION

- Provides the Joint Services an improved Automatic Man-portable Chemical Agent Alarm for detection and warning of battlespace chemical agents.

CHARACTERISTICS/DESCRIPTION

- Man-portable Automatic Chemical Alarm (test)
- Non-Developmental Item (NDI) solution to Joint Service Requirements
- Shipboard variant for operation under specific shipboard environment

CAPABILITY/IMPROVEMENTS

- Automatic detection and identification of all classes of nerve and blister agents
- Surface sampler to detect agent/vapor on surfaces at cold temperature
- Operation in Collective Protection Equipment
- Replaces M8A1 alarm

SPECIAL FEATURES

- Compatible with Multipurpose Integrated Chem Agent Detector (MICAD) information transfer system

CONTRACTORS

- Graseby Dynamics Ltd., UK
- Science & Tech Research Inc., Fulton, MD

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	106.7										106.7
PROC	70.0	36.9	49.4	0.5	0.1						156.8
TOTAL	176.7	36.9	49.4	0.5	0.1						263.6
QTY	7559	4233	6721								18513

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	106.7										106.7
PROC	64.0	41.4	69.1	0.6	0.2						175.3
TOTAL	170.7	41.4	69.1	0.6	0.2						282.1
QTY	6837	4890	8562								20289
PGM Chg	(6.0)	4.5	19.8	0.1	0.1						18.5

Notes
Prior/FY98 quantities updated to actuals with accessory items such as surface samplers.
FY00 funding includes procurement of 235 shipboard ACADAs and 30 surface samplers. FY01 funds include 270 surface samplers. FY02/03 funds systems fielding support. Requirement transitions to JCAD beginning in FY04.

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 31508
Joint Acq Objective: 31703
QTY Through FY07: 20289

O&O/ORD

Unit	ORG	QTY
PLT/ALL	USA	1
CO/ALL	USA	2
Hospitals/	USA	35
CPE Shelte	USA	1
Decon	USA	3
All	USN	535
All	USMC	580
All	USAF	1562

Fielding

- See Schedule

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	8.642
Program Acq Cost	19.053
Quantity	20289

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	106.7
Procurement	175.3
Total Program	282.1

Current Status

- **DOD POSITION**
  - ACADA provides improved multi-agent detector capability.
- **FIELDING**
  - Fielding began in FY98. Fielding to TRADOC completed. Fielding accomplished to M93A1 NBCRS equipped units USASOC and WMD Civil Support teams. Fielding initiated to USMC, USN, USAF.
- **QUANTITY**
  - Delivered as follows as of Sep 99:
  - USA = 1021
  - USAF = 350
  - USN = 162
  - USMC = 116
  - ANG (CSD) = 142
- **PROCUREMENT**
  - Procurement initiated 1QFY96.
- **FMS**
  - None
- **MODIFICATIONS**
  - P3I to add surface sampling begins production 1QFY01.
- **ISSUES**
  - None

EXECUTIVE SUMMARY PRODUCED BY JSCBIS

UNCLASSIFIED

ACADA - AUTOMATIC CHEMICAL AGENT DETECTOR AND ALARM

UNCLASSIFIED

1 FEB 2001
SAAL-ZCS PAUL LANGE (703) 604-7245
DAMO-FDB COL IZZO (703) 695-3089

Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE							
Proc							
Total							

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

SASC: Mr. Joe Sixeas
- No Language

SAC-D: Mr. John Young
- No Language

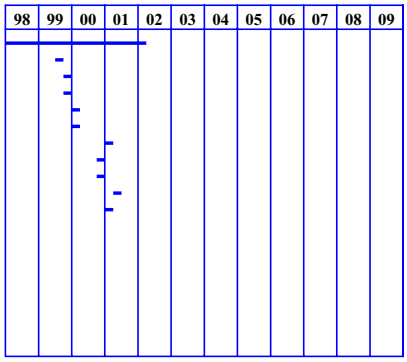
Conf
- No Language

Conf
- No Language

Notes

ACADA is a man-portable, point sampling alarm system that detects and identifies all nerve agents, mustard, and lewisite by class.

Schedule



EXECUTIVE SUMMARY PRODUCED BY JSCBIS

UNCLASSIFIED

CBMS - CB MASS SPECTROMETER (CBMS)

UNCLASSIFIED

1 FEB 2001
SAAL-ZCS PAUL LANGE (703) 604-7245
DAMO-FDB COL IZZO (703) 695-3089

System Description

MISSION

- Detect and identify chemical and biological agents as a component for the BIDS P3I, NBCRS Block II, and JSLNBCRS.

CHARACTERISTICS/DESCRIPTION

- Pyrolisis Ion-Trap Mass Spectrometer (MS)
- Block I -- 260 lbs, separate chem and bio probes, generic (class) bio detection
- Block II -- 130 lbs, concurrent chem/bio operation, bio identification

CAPABILITY/IMPROVEMENTS

- Provides real time CB detection and identification
- BLOCK I: Detect BW agents at 15 air containing particles per liter of air (ACPLA) in 3 min.
- BLOCK II: Detect BW agents at 1 ACPLA in 3 min.

SPECIAL FEATURES

- Ground probe for chemical reconnaissance (NBCRS)
- Aerosol sampler/pyrolyzer for biological protection (BIDS/NBCRS)

CONTRACTORS

- Block I:
  - Bruker Instruments, Inc. (Billerica, MA)
  - Bruker-Franzen (Germany)
- Block II:
  - Oak Ridge National Laboratory (ORNL), (Oak Ridge, TN)
  - Orbital Sciences Corp. (Dulles, VA)

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	45.2	9.3									54.5
PROC											
TOTAL	45.2	9.3									54.5
QTY											

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	45.2	10.4	1.9								57.5
PROC											
TOTAL	45.2	10.4	1.9								57.5
QTY											
PGM Chg		1.1	1.9								3.0

Notes
CBMS procurement for outyears is included in host platforms (BIDS P3I, NBCRS BLK II, and JSLNBCRS) funding lines.

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 0
Joint Acq Objective: 0
QTY Through FY07: 0

O&O/ORD

Unit	ORG	QTY
Bio Comp (BIDS)	USA	38
USAMCLS (BIDS)	USA	4
Recon Corp Chem Hvy D	USA	36
Recon PLT CHEM ACR	USA	6
Recon PLT	USA	6

Fielding

- BIDS P3I - FY99-00
- NBCRS BLK II - FY05-07
- JSLNBCRS IOC - 4QFY01

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	None
Program Acq Cost	None
Quantity	None

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	57.5
Procurement	0.0
Total Program	57.5

Current Status

- **DOD POSITION**
  - The CBMS (Block I) is a critical component of the P3I BIDS, which has the full support of the Department to provide biological detection capability.
  - The CBMS (Block II) is a critical component of the JSLNBCRS and the Fox Block II.
- **FIELDING**
  - 42 P3I BIDS to be fielded beginning FY99.
- **QUANTITY** - N/A
- **PROCUREMENT**
  - CBMS (Block I) procurement began in FY97 for P3I BIDS.
- **FMS**
  - None
- **MODIFICATIONS**
  - CBMS (Block II) will enter EMD phase in FY97-00 to meet JSLNBCRS/JBPDS (Block II)/NBCRS ORD.
- **ISSUES**
  - None

CBMS - CB MASS SPECTROMETER (CBMS)

UNCLASSIFIED

1 FEB 2001
SAAL-ZCS PAUL LANGE (703) 604-7245
DAMO-FDB COL IZZO (703) 695-3089

Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE							
Proc							
Total							

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

SASC: Mr. Joe Sixeas
- No Language

SAC-D: Mr. John Young
- No Language

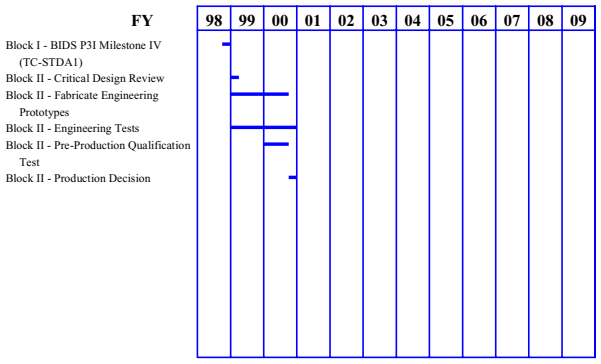
Conf
- No Language

Conf
- No Language

Notes

The CBMS detects and characterizes all known chemical and biological threat agents. It continuously and automatically detects threat agents via a mass analyzer chassis, a biological aerosol sampling prove, a surface sampling prove and sample identification device.

Schedule



1 FEB 2001
SAAL-ZCS PAUL LANGE (703) 604-7245
DAMO-FDB COL IZZO (703) 695-3089

System Description

MISSION

- Acquisition of Chemical and Biological Defense equipment Reserve Component (RC) per Weapons of Mass Destruction (WMD) Plan.

CHARACTERISTICS/DESCRIPTION

- Equip WMD Civil Support Teams (WMD-CST), Domestic Response Casualty Decontamination (DRCD) teams, and Domestic Nuclear, Biological, and Chemical (NBC) Reconnaissance teams for response at state level

CAPABILITY/IMPROVEMENTS

- Equip RC chemical companies and medical patient decon team to augment hospital patient decon capabilities
- Equip ARNG and Army Reserve chemical elements with initial complement equipment for WMD Reconnaissance for RC deployment

SPECIAL FEATURES

- Program individual equipment item quantities are contained in appropriate item executive summary

CONTRACTORS

- N/A

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE											
PROC	14.6	8.7	1.2		1.2		1.2				26.7
TOTAL	14.6	8.7	1.2		1.2		1.2				26.7
QTY											

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE											
PROC	14.6	8.6	2.1		1.2		1.2				27.7
TOTAL	14.6	8.6	2.1		1.2		1.2				27.7
QTY											
PGM Chg			1.0								1.0

Notes
FY00 OSD(C) plus up to increase support to WMD CST.

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 0
Joint Acq Objective: 0
QTY Through FY07: 0

O&O/ORD

Unit	ORG	QTY

Fielding

- CST 17
- DRCD 65
- Domestic NBC Recon 21

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	None
Program Acq Cost	None
Quantity	None

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	0.0
Procurement	27.7
Total Program	27.7

Current Status

- **DOD POSITION** - N/A
- **FIELDING** - N/A
- **QUANTITY** - N/A
- **PROCUREMENT**
  - M40 Chemical Mask* - FY99 270, FY00 459
  - ICAM* - FY99 414, FY00 342, FY01 90
  - ICAM Simulator* - FY99 138, FY00 111, FY01 45
  - ACADA* - FY99 438, FY00 298
  - Pocket RADIAC* - FY99 852, FY00 984, FY01 180
  - Alpha RADIAC** - FY99 214, FY00 238
  - Beta RADIAC** - FY99 214, FY00 238
  - C2A1 Canister Refill** - FY99 270, FY00 1571
  - *Quantity contained in applicable executive summary.
  - **Centrally managed and procured from item manager.
- **FMS** - N/A
- **MODIFICATIONS** - N/A
- **ISSUES** - N/A

Guard&Res - GUARD & RESERVE EQUIPMENT
UNCLASSIFIED

1 FEB 2001
SAAL-ZCS PAUL LANGE (703) 604-7245
DAMO-FDB COL IZZO (703) 695-3089

Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE							
Proc							
Total							

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

SASC: Mr. Joe Sixeas
- No Language

SAC-D: Mr. John Young
- No Language

Conf
- No Language

Conf
- No Language

Notes

Schedule

FY	98	99	00	01	02	03	04	05	06	07	08	09

ICAM - IMPROVED CHEM AGENT MONITOR (ICAM)

UNCLASSIFIED

1 FEB 2001
SAAL-ZCS PAUL LANGE (703) 604-7245
DAMO-FDB COL IZZO (703) 695-3089

System Description

MISSION

- Quickly locate the presence of (or lack of) nerve and mustard contamination on personnel or equipment.

CHARACTERISTICS/DESCRIPTION

- Hand-held, service member-operated
- Real time, low level detection of both nerve and mustard vapors
- Provides relative magnitude of hazard
- Not affected by common battlespace interference
- Differentiates between nerve and mustard agents

CAPABILITY/IMPROVEMENTS

- Reduce logistic burden of decon ops
- Reduce commanders' decision task
- Increase availability of assets
- Improved reliability over original model CAM
- Faster start-up
- Less maintenance required
- Reduced maintenance costs
- Eliminates depot repair

SPECIAL FEATURES

- Real time detection of nerve and mustard agent vapors
- Capable of day and night operation
- Can be carried while allowing free use of both hands
- Provides visual indication of battery condition
- Capable of operation by personnel in protective clothing
- System is NBC contamination survivable
- Transportable by air, land, and water via tactical or non-tactical vehicles, and may be deployed with airborne personnel

CONTRACTORS

- Intellitec Div., Technical Products Group, Inc., DeLand, FL

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE											
PROC	26.5	12.7	12.8	0.3	0.1						52.3
TOTAL	26.5	12.7	12.8	0.3	0.1						52.3
QTY	4763	3112	3003								10878

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE											
PROC	31.2	14.3	18.8	0.3	0.1						64.7
TOTAL	31.2	14.3	18.8	0.3	0.1						64.7
QTY	5231	3502	4445								13178
PGM Chg	4.7	1.6	6.0								12.4

Notes

Chemical Agent Monitor (CAM) Simulators are funded in this program. Prior year include CAMs.
FY00 funds 128 replacement assemblies. FY02/03 funds royalty payments to the UK and systems fielding support. Requirements transition to the JCAD beginning of FY 02.

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 23890
Joint Acq Objective: 30408
QTY Through FY07: 13178

O&O/ORD

Unit	ORG	QTY
Chem Units	USA	2
Chem Units	USA	3
Med CO	USA	3
Med Unit/P	USA	1
Med CO/Cor	USA	4
Srvc Sch	USA	10
CO/all	USA	2
PLT/detach	USA	2
Area NBC S	USA	5
Med Ships	USN	6

Fielding

- See Schedule

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	4.905
Program Acq Cost	4.905
Quantity	13178

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	0.0
Procurement	64.7
Total Program	64.7

Current Status

- **DOD POSITION**
  - ICAM supports OSD modernization objectives by improving survivability on a chemical battlespace. ICAM represents modernization of existing CAM system and provides improved reliability, start-up characteristics, and lower life-cycle cost.
- **FIELDING**
  - ICAMs were fielded to the Army's Technical Escort Unit in January 1999, Chemical School and Signal School, Ft. Gordon, GA [ICAM maintenance trainers] in February 1999, Ft. Bragg (FORSCOM and SOCOM) in August 1999, Ft Hood in February 2000, Ft. Campbell in April 2000, Ft. Stewart in July 2000, Ft. Riley in August 2000, Ft. Lewis in October 2000, and Ft. Carson in January 2001. Korea is scheduled for February 2001, USARPAC for June 2001, and USARC October 2001.
- **QUANTITY** - N/A
- **PROCUREMENT**
  - 14,103 CAMs procured and delivered to all services, plus 875 ICAMs procured and delivered to the Marine Corps. 10833 ICAMs will be procured and delivered to Army and Navy by May 02.
- **FMS**
  - Egypt.
  - Korea.
- **MODIFICATIONS**
  - Improved reliability.
  - Less maintenance required.
  - Faster start-up.
  - Reduced maintenance costs.
  - Eliminates depot repair.
- **ISSUES**
  - 4,689 ICAMs needed to complete the Army and Navy requirement remain unfunded.
  - 13,580 Mod kits required to upgrade CAMs remain unfunded.
  - 917 CAM training simulators required for all services, 410 funded and 507 unfunded.

ICAM - IMPROVED CHEM AGENT MONITOR (ICAM)

UNCLASSIFIED

1 FEB 2001
SAAL-ZCS PAUL LANGE (703) 604-7245
DAMO-FDB COL IZZO (703) 695-3089

Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE							
Proc							
Total							

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

SASC: Mr. Joe Sixeas
- No Language

SAC-D: Mr. John Young
- No Language

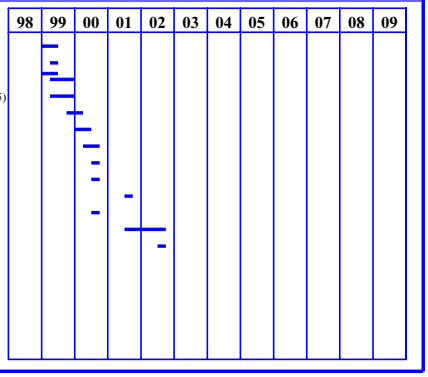
Conf
- No Language

Conf
- No Language

Notes

The Improved Chemical Agent Monitor (ICAM) and it's predecessor, the CAM, are a hand held, soldier operated, post attack device for monitoring chemical agents. The ICAM detects vapors of chemical agents by sensing molecular ions of specific mobilities (time of flight) and uses timing and microprocessor techniques to reject interferences. The monitor detects and discriminates between vapors of nerve and mustard agents. The ICAM consists of a drift tube, signal processor, molecular sieve, membrane, and expendables such as batteries, buzzer, alternate battery pack, confidence tester, and dust filters. Themonitor is 4" x 7" x 15", and weighs approximately 5 pounds

Schedule



IPDS - IMPROVED POINT DETECTION SYSTEM (IPDS)

UNCLASSIFIED

1 FEB 2001
SAAL-ZCS PAUL LANGE (703) 604-7245
DAMO-FDB COL IZZO (703) 695-3089

System Description

MISSION

- Used during high threat conditions on surface ships, IPDS automatically detects and warns of chemical warfare vapor agent presence.

CHARACTERISTICS/DESCRIPTION

- Automatically detects low concentrations of nerve and blister agent vapor
- One minute from encounter to alarm
- Rejects all known shipboard interferents
- Uses ion mobility spectroscopy technology

CAPABILITY/IMPROVEMENTS

- Reduces false alarms
- Improves agent detection (blister agents)
- Increases detection sensitivity
- Expandable for detection of new and novel agents

SPECIAL FEATURES

- Permanently installed point detection system
- Replaces the Chemical Agent Point Detection System (CAPDS)
- Withstands harsh marine and shipboard elecromagnetic interference environment

CONTRACTORS

- Powertronics Systems, Inc., New Orleans, LA

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	0.2										0.2
PROC	19.1	8.6	4.7	4.7	4.7						41.7
TOTAL	19.3	8.6	4.7	4.7	4.7						41.9
QTY	177	64									241

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	0.2										0.2
PROC	19.3	8.7	4.6	4.7	4.7						42.0
TOTAL	19.5	8.7	4.6	4.7	4.7						42.2
QTY	177	52									229
PGM Chg	0.2	0.1	(0.1)								0.3

Notes
Reduction of 12 units due to re-evaluation of facility requirements.

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 254
Joint Acq Objective: 254
QTY Through FY07: 229

O&O/ORD

Unit	ORG	QTY
Surface Ships	USN	210
Coast Guard	USN	44
Training Sites	USN	3

Fielding

- West Coast ships: 24
- East Coast ships: 45
- Training sites: 6 (1/2 system each)

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	183.545
Program Acq Cost	184.401
Quantity	229

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	0.2
Procurement	42.0
Total Program	42.2

Current Status

- **DOD POSITION**
  - Chemical agent detection is an essential program fully supportive of Navy Area Mission Profile.
- **FIELDING**
  - Installations completed on the following ships:
  - West coast: Three Aircraft Carriers, 18 Surface Combatants, and three Amphibious ships.
  - East coast: Two Aircraft Carriers, 29 Surface Combatants, nine Amphibious and five Mine Warfare ships.
- **QUANTITY**
  - 69 IPDS units have been fielded and 3 have been refurbished and provided to 6 training sites (1/2 system each)
- **PROCUREMENT**
  - First production contract awarded 10/96; second production contract awarded 2/99. Options exercised 9/99 and 2/00.
- **FMS** - N/A
- **MODIFICATIONS** - N/A
- **ISSUES** - N/A

EXECUTIVE SUMMARY PRODUCED BY JSCBIS

UNCLASSIFIED

IPDS - IMPROVED POINT DETECTION SYSTEM (IPDS)

UNCLASSIFIED

1 FEB 2001
SAAL-ZCS PAUL LANGE (703) 604-7245
DAMO-FDB COL IZZO (703) 695-3089

Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE							
Proc							
Total							

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

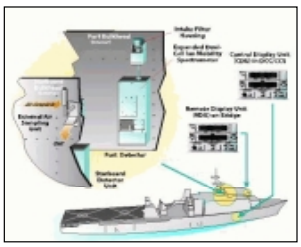
SASC: Mr. Joe Sixeas
- No Language

SAC-D: Mr. John Young
- No Language

Conf
- No Language

Conf
- No Language

Notes



The IPDS is a shipboard point detector and alarm that detects nerve and blister agents at low levels and automatically provides an alarm to the ship. It uses special elongated ion mobility cells to achieve the resolution necessary to counter false alarms caused by interferent vapors.

Schedule

FY	98	99	00	01	02	03	04	05	06	07	08	09
2nd Contract Award		-										
Award Production Options		—										
Delivery of Production Units			-									
First Unit Equipped (FUE)/Initial Operating Capability (IOC)			-									

EXECUTIVE SUMMARY PRODUCED BY JSCBIS

UNCLASSIFIED

JCAD - JOINT CHEMICAL AGENT DETECTOR (JCAD)

UNCLASSIFIED

1 FEB 2001
SAAL-ZCS PAUL LANGE (703) 604-7245
DAMO-FDB COL IZZO (703) 695-3089

System Description

MISSION

- Develop and procure a system that will automatically and simultaneously detect, identify, quantify, and warn of the presence of chemical warfare (CW) agents by class (nerve, blister, and blood) in aircraft/shipboard/vehicle interiors, fixed sites and for personnel use.

CHARACTERISTICS/DESCRIPTION

- Small, lightweight detector that automatically detects chemical agents for a variety of missions

CAPABILITY/IMPROVEMENTS

- Detects at low concentrations to avoid meliosis effects
- Improves individual warfighter detection capability
- Replaces CAM, ICAM, M8A1, M90, and ACADA (M22)

SPECIAL FEATURES

- Common detection system, with components developed to meet Joint Service requirements
- Measures and records CW agents dose and concentration levels for subsequent download to data analysis unit
- Data port available to be compatible with current and future warning and reporting systems such as JWARN

CONTRACTORS

- BAE SYSTEMS Inc., Austin, TX.

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	23.2	13.6	12.7								49.5
PROC	0.1			27.2	27.9	25.9	26.0	26.0	26.0	Cont.	Cont.
TOTAL	23.3	13.6	12.7	27.2	27.9	25.9	26.0	26.0	26.0	Cont.	Cont.
QTY				13623	14017	12982	13058	13000	13000	Cont.	Cont.

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	23.2	11.7	12.4	15.1							62.4
PROC	0.1				29.7	26.1	26.2	26.3	26.3	Cont.	Cont.
TOTAL	23.3	11.7	12.4	15.1	29.7	26.1	26.2	26.3	26.3	Cont.	Cont.
QTY					10836	9117	9122	9130	9130	Cont.	Cont.
PGM Chg		(1.9)	(0.3)	(12.1)	1.7	0.2	0.2	0.3	0.3		

Notes

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 257135
Joint Acq Objective: 270338
QTY Through FY07: 47335

O&O/ORD

Unit	ORG	QTY
	USA	230000
	USN	2500
	USAF	9150
	USMC	15485

Fielding

- TBD

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	2.832
Program Acq Cost	4.466
Quantity	38205

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	62.4
Procurement	134.5
Total Program	196.9

Current Status

- **DOD POSITION** - N/A
- **FIELDING** - N/A
- **QUANTITY** - N/A
- **PROCUREMENT**
  - The figures in this budget cycle reflect procurement in FY 03.
- **FMS** - N/A
- **MODIFICATIONS**
  - N/A
- **ISSUES**
  - None

JCAD - JOINT CHEMICAL AGENT DETECTOR (JCAD)

UNCLASSIFIED

1 FEB 2001
SAAL-ZCS PAUL LANGE (703) 604-7245
DAMO-FDB COL IZZO (703) 695-3089

Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE							
Proc							
Total							

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

SASC: Mr. Joe Sixeas
- No Language

SAC-D: Mr. John Young
- No Language

Conf
- No Language

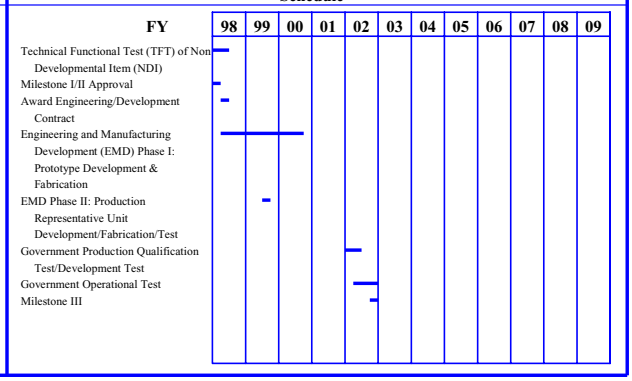
Conf
- No Language

Notes

User Need Date:
Mar 00 JSIG extended IOC to FY03.

The JCAD will be a lightweight device that will automatically detect, identify, quantify, and warn of the presence of nerve agents and blister agents in vapor form on personnel or in compartments and aircraft interiors.

Schedule



JSLNBCRS - JS LTWT NBC RECON SYS (JSLNBCRS)

UNCLASSIFIED

System Description

MISSION

- Provide Marine Air-Ground Task Forces, AF Task Forces, and USA Light Contingency Forces with a lightweight system able to detect, identify, and warn commanders of contaminated areas.

CHARACTERISTICS/DESCRIPTION

- Complete and integrated suite
- Stand-off (Chemical) and point detection (Chem/Bio)
- Contamination area marking
- Automated NBC hazard prediction, analysis and dissemination
- Radiation detection
- GPS -- contaminated areas digital mapping
- MET-- Collect and analyze meteorological data
- Communications/Collective protection

CAPABILITY/IMPROVEMENTS

- Transportability: HMMWV variant (CH-47); HMMWV and LAV variant (CH-53E) and (MV-22)
- Organic platform (HMMWV, LAV)
- Advanced NBC detection
- Automated hazard detection, reporting, and mapping

SPECIAL FEATURES

- Electronically map contaminated areas
- Provide meteorological data
- Interface with NBC detection suite

CONTRACTORS

- RDT&E - TRW, Carson, CA
- Production Contractor - TBS

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	21.2	6.5	7.9								35.6
PROC			60.7	97.6	67.0	60.5	69.6	71.8	70.9	Cont.	Cont.
TOTAL	21.2	6.5	68.6	97.6	67.0	60.5	69.6	71.8	70.9	Cont.	Cont.
QTY			45	72	43	44	57	59	58	Cont.	Cont.

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	21.2	7.5	11.2	13.0	1.8						54.7
PROC			0.3		73.1	68.1	70.6	70.7	70.8	Cont.	Cont.
TOTAL	21.2	7.5	11.5	13.0	74.9	68.1	70.6	70.7	70.8	Cont.	Cont.
QTY					54	51	57	57	57	Cont.	Cont.
PGM Chg		0.9	(57.1)	(84.6)	8.0	7.5	1.0	(1.1)	(0.1)		

Notes
FY98 updated to actuals.
PDM I - Adds FY01 - $7.9 for RDTE; FY01 - $21.6M, FY02 - $16.8M for Proc of 30 additional systems.

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 702
Joint Acq Objective: 317
QTY Through FY07: 276

O&O/ORD

Unit	ORG	QTY
All	USA	547
All	USMC	69
All	USAF	86

Fielding

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	1291.164
Program Acq Cost	1540.858
Quantity	219

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	54.7
Procurement	353.5
Total Program	408.2

Current Status

- **DOD POSITION** - N/A
- **FIELDING**
  - IOC scheduled for 3rd Qtr FY03.
- **QUANTITY** - N/A
- **PROCUREMENT**
  - Competitive,
  - Large industrial base for procurement.
- **FMS**
  - None
- **MODIFICATIONS**
  - None
- **ISSUES** - N/A

1 FEB 2001
SAAL-ZCS PAUL LANGE (703) 604-7245
DAMO-FDB COL IZZO (703) 695-3089

JSLNBCRS - JS LTWT NBC RECON SYS (JSLNBCRS)

UNCLASSIFIED

Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE							
Proc							
Total							

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

SASC: Mr. Joe Sixeas
- No Language

SAC-D: Mr. John Young
- No Language

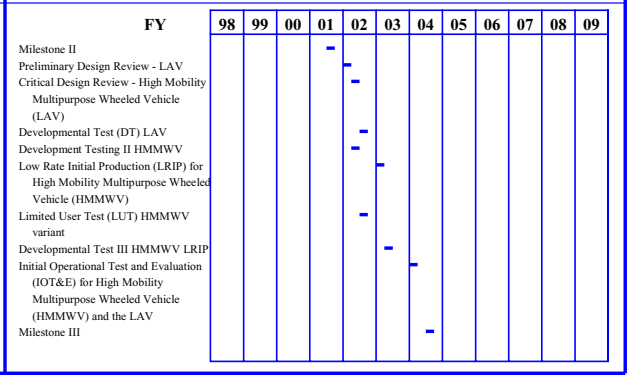
Conf
- No Language

Conf
- No Language

Notes

The LNBCRS will provide a premiere vehicle for accurate, rapid NBC combat hazard information by verifying the absence of, finding, mapping, and marking NBC hazards.

Schedule



JSLSCAD - JS LIGHTWEIGHT STANDOFF CHEMICAL AGENT DET (JSLSC

UNCLASSIFIED

1 FEB 2001
SAAL-ZCS PAUL LANGE (703) 604-7245
DAMO-FDB COL IZZO (703) 695-3089

System Description

MISSION

- Locate, identify and report presence of chemical agent clouds.

CHARACTERISTICS/DESCRIPTION

- Passive, stand-off chemical detection -- up to 5km
- Real time, on-the-move operation
- Mounts on land, air, and sea platforms
- Provides chemical warning & reporting for the digitized battlefield
- Lightweight (45-57 lbs)

CAPABILITY/IMPROVEMENTS

- First time ability to provide on-the-move 360 degree stand-off detection of CW agents
- Provides early alarm & avoidance capability
- Key chemical sensor for the digitized battlefield with automated reporting
- Wide-area Chem surveillance from air platform

SPECIAL FEATURES

- Detects nerve, blister, and blood agents
- No dedicated operator
- Continuous, 360 degree protection
- Automated real time reporting
- Mounted in the NBCRS BLK II, JSLNBCRS and other AF and Navy ships.

CONTRACTORS

- Intellitec, Inc., Delano, FL

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	35.1	14.4	15.5	5.8							70.8
PROC				3.1	9.0	19.1	28.9	40.0	45.0	Cont.	Cont.
TOTAL	35.1	14.4	15.5	9.0	9.0	19.1	28.9	40.0	45.0	Cont.	Cont.
QTY				30	53	149	248	330	372	Cont.	Cont.

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	35.1	18.1	18.8	5.9							78.0
PROC				10.4	14.6	19.3	23.6	40.4	45.5	Cont.	Cont.
TOTAL	35.1	18.1	18.8	16.3	14.6	19.3	23.6	40.4	45.5	Cont.	Cont.
QTY				70	106	149	198	330	372	Cont.	Cont.
PGM Chg		3.8	3.4	7.3	5.6	0.2	(5.3)	0.4	0.5		

Notes

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 1881
Joint Acq Objective: 1917
QTY Through FY07: 1225

O&O/ORD

Unit	ORG	QTY
All	USA	492
All	USAF	567
All	USN	627
All	USMC	231

Fielding

- TBD

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	126.905
Program Acq Cost	218.345
Quantity	853

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	78.0
Procurement	153.7
Total Program	231.7

Current Status

- **DOD POSITION**
  - Joint program strongly supported for its stand-off detection/alarm capability.
- **FIELDING**
  - Army/Navy/USAF/USMC initiate fielding FY04.
- **QUANTITY** - N/A
- **PROCUREMENT**
  - Procurement to be initiated FY02.
- **FMS**
  - None
- **MODIFICATIONS**
  - None
- **ISSUES**
  - None

EXECUTIVE SUMMARY PRODUCED BY JSCBIS

UNCLASSIFIED

JSLSCAD - JS LIGHTWEIGHT STANDOFF CHEMICAL AGENT DET (JSLSC

UNCLASSIFIED

1 FEB 2001
SAAL-ZCS PAUL LANGE (703) 604-7245
DAMO-FDB COL IZZO (703) 695-3089

Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE							
Proc							
Total							

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

SASC: Mr. Joe Sixeas
- No Language

SAC-D: Mr. John Young
- No Language

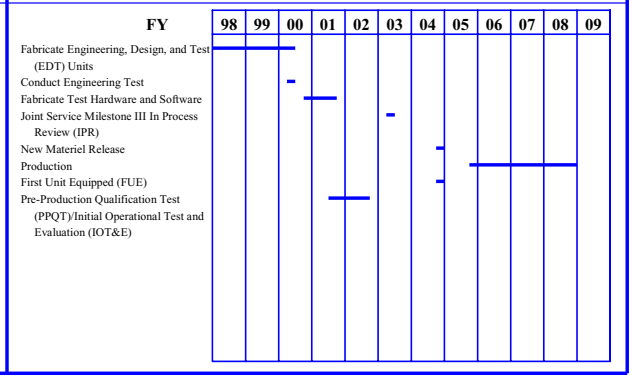
Conf
- No Language

Conf
- No Language

Notes

The JSLSCAD is a lightweight, passive, standoff, chemical agent detector. It is capable of providing up to 360 degree on-the-move vapor detection at distances up to 5 kilometers.

Schedule



EXECUTIVE SUMMARY PRODUCED BY JSCBIS

UNCLASSIFIED

JWARN - JOINT WARNING & REPORTING NETWORK (JWARN)

UNCLASSIFIED

1 FEB 2001
SAAL-ZCS PAUL LANGE (703) 604-7245
DAMO-FDB COL IZZO (703) 695-3089

System Description

MISSION

- JWARN will provide networking capability for deployed NBC detectors and process the incoming data to provide a real-time warning for potentially contaminated areas.

CHARACTERISTICS/DESCRIPTION

- Two-way interface with current and planned individual service C4I2 hardware and software
- Provides overlays of hazardous areas
- Phase I - initial acquisition and fielding of COTS and GOTS software as standard for Armed Services
- Phase II - integration of NBC legacy future detectors modules and NBC Battlefield Management modules

CAPABILITY/IMPROVEMENTS

- Rapidly predict downwind hazardous areas
- Reside on mobile/fixed platforms
- Built-in communication module
- Compatible with Allied Technological Publication (ATP)-45

SPECIAL FEATURES

- Predict downwind hazards from chemical accidents/incidents
- Interfaced to Global Command and Control System
- NBC risk assessment
- Automatic ID of units in hazard areas

CONTRACTORS

- COTS: Bruhn Newtech, Ellicott City, MD
- Phase I: Bruhn Newtech, Ellicott City, MD
- Phase II:TBS

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	38.1	8.3	7.3	7.3	5.5						66.5
PROC	17.1	8.9	9.0	11.7	10.6	12.2	12.3	16.0	32.0	Cont.	Cont.
TOTAL	55.2	17.2	16.3	19.0	16.1	12.2	12.3	16.0	32.0	Cont.	Cont.
QTY	128		516	544	508	539	563	302	604	Cont.	Cont.

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	44.3	8.4	7.1	17.4	5.2						82.4
PROC	17.1	9.6	8.5			12.3	12.4	16.2	32.4	Cont.	Cont.
TOTAL	61.3	18.0	15.6	17.4	5.2	12.3	12.4	16.2	32.4	Cont.	Cont.
QTY	128					753	769	1003	2007	Cont.	Cont.
PGM Chg	6.1	0.8	(0.7)	(1.6)	(10.8)	0.1	0.1	0.2	0.4		

Notes

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 2842
Joint Acq Objective: 2874
QTY Through FY07: 4660

O&O/ORD

Unit	ORG	QTY
All	USN	375
All	USA	1500
All	USAF	789
All	USMC	210

Fielding

- FY98 Phase I
- FY00 Phase II
- FY03 FOC

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	28.649
Program Acq Cost	59.697
Quantity	2653

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	82.4
Procurement	108.4
Total Program	190.7

Current Status

- **DOD POSITION**
  - Continues consolidation of Service Chemical, Biological and Nuclear (Radiological) Program.
- **FIELDING**
  - Interim operating capability (IOC) (COTS NDI) completed 4QFY99.
  - Initial operating capability (Integration with sensors/detectors) scheduled for 4QFY02.
- **QUANTITY** - N/A
- **PROCUREMENT** - N/A
- **FMS**
  - N/A
- **MODIFICATIONS**
  - N/A
- **ISSUES**
  - None

EXECUTIVE SUMMARY PRODUCED BY JSCBIS

UNCLASSIFIED

JWARN - JOINT WARNING & REPORTING NETWORK (JWARN)

UNCLASSIFIED

1 FEB 2001
SAAL-ZCS PAUL LANGE (703) 604-7245
DAMO-FDB COL IZZO (703) 695-3089

Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE							
Proc							
Total							

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

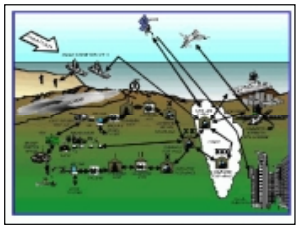
SASC: Mr. Joe Sixeas
- No Language

SAC-D: Mr. John Young
- No Language

Conf
- No Language

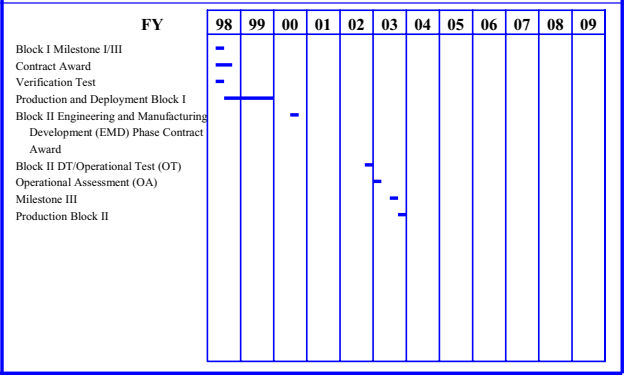
Conf
- No Language

Notes



JWARN will provide Joint Forces with a comprehensive analysis and response capability to minimize the effects of hostile NBC attacks or accidents/ incidents. It will provide the operational capability to employ NBC warning technology that will collect, analyze, identify, locate, report, and disseminate NBC threats.

Schedule



EXECUTIVE SUMMARY PRODUCED BY JSCBIS

UNCLASSIFIED

NBCRSBLKI - RECON SYSTEM, FOX NBC (NBCRS) MODS

UNCLASSIFIED

1 FEB 2001
SAAL-ZCS PAUL LANGE (703) 604-7245
DAMO-FDB COL IZZO (703) 695-3089

System Description

MISSION

- To locate, mark and report Nuclear, Biological and Chemical (NBC) contamination.

CHARACTERISTICS/DESCRIPTION

- Wheeled, light-armored, chemical detection vehicle
- Combat empty weight -- 20.2 tons
- Maximum speed -- 65 mph
- Range -- 450 miles
- Air transportability -- C141/C5A

CAPABILITY/IMPROVEMENTS

- M93 -- Adds 3,300 soldiers per day (2.2 Battalion Task Force) to a Heavy Division in a chemical war
- M93A1 -- Adds additional 608 soldiers per day more than the M93 to a Heavy Division in a chemical war

SPECIAL FEATURES

- M93: Mass spectrometer (MS); Chemical/Nuclear agent 4-man crew monitors and point detectors; Positive pressure vapor protection; Secure radios
- M93A1: Digitized sensor suite, 3-man crew; Improved MS and sampling system; Stand-off chemical vapor detector

CONTRACTORS

- General Dynamics Land Systems Division (GDLS), Detroit, MI
- RheinMetall, Germany
- Bruker-Franzen, Germany
- Anniston Army Depot, TX

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE		4.0									4.0
PROC	51.2	24.7	31.6	6.3							113.8
TOTAL	51.2	28.7	31.6	6.3							117.8
QTY	24	11	13	1							49

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE		3.9	3.9								7.8
PROC	51.2	25.6	57.8	6.4							141.0
TOTAL	51.2	29.5	61.7	6.4							148.8
QTY	50										50
PGM Chg		0.8	30.2								31.0

Notes
FY00 and FY01 congressional plus ups for Fox Chemical Simulation Training Suites to be installed at Fort Hood and Fort Polk.
Transitions to NBCRS BLK II in FY 03.

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 123
Joint Acq Objective: 133
QTY Through FY07: 50

O&O/ORD

Unit	ORG	QTY
USACMLS	USA	6
68th/Hood	USA	6
4th ID/Hood	USA	6
44th/Hood	USA	8
92th/Stewart	USA	6
	USMC	8
89th/Carson	USA	6
FORSCOM	USA	22
EUSA	USA	6
USAREUR	USA	12

Fielding

- 4 Marine Corp Camp Pendleton, Oct 1999
- 6 Ft Carson June 2000
- 4 FORSCOM Ft Lewis Aug 2000
- 6 EUSA Camp Casey Oct 2000
- 12 USAREUR Feb/Nov01

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	2819.260
Program Acq Cost	2975.920
Quantity	50

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	7.8
Procurement	141.0
Total Program	148.8

Current Status

- **DOD POSITION**
  - The FOX NBCRS supports the Defense Modernization Objective of reducing force structure via a 3- versus 4-man crew and of reducing operating costs.
- **FIELDING**
  - Total will be 87 BLOCK I systems fielded.
- **QUANTITY**
  - 50 M93A1 Foxes have been fielded to the Army. Four to Marine Corps.
- **PROCUREMENT**
  - 48 systems were produced in FY90-92. 60 systems were received as gifts from Germany during Operation Desert Shield (10 went to MC), and 5 were purchased using Foreign Weapons Evaluation (Nunn) funding. Ten systems were produced as test systems for the system modification (RDTE) phase.
- **FMS**
  - None
- **MODIFICATIONS**
  - Existing systems will be modified in FY96-02 to meet ROC.
- **ISSUES**
  - Production funding is available for modification of 87 systems to BLK I and 38 systems to BLK II configuration. $66M required to upgrade the remaining 33 systems to the BLK I configuration.

EXECUTIVE SUMMARY PRODUCED BY JSCBIS

UNCLASSIFIED

NBCRSBLKI - RECON SYSTEM, FOX NBC (NBCRS) MODS

UNCLASSIFIED

1 FEB 2001
SAAL-ZCS PAUL LANGE (703) 604-7245
DAMO-FDB COL IZZO (703) 695-3089

Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE						5.0	4.0
Proc			10.0				
Total			10.0			5.0	4.0

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

SASC: Mr. Joe Sixeas
- $10.0M in the M93 FOX NBC Reconnaissance Vehicle program for the procurement of the Block I M93A1 upgrade

SAC-D: Mr. John Young
- $5.0M for M93 A1 Fox Chemical Simulation Training Suites.

Conf
- No Language

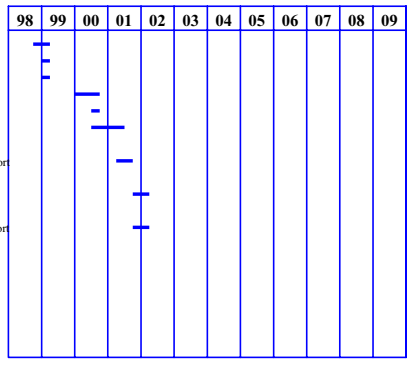
Conf
- No Language

Notes

Special Information/Earmarks for Appropriated Funds:
M93A1 Fox Chemical Training Suite (Moran/Shelby) $4.0M

The NBCRS is a dedicated system for NBC detection, warning, and sampling equipment integrated into a high speed, high mobility armored carrier. It can find and mark chemical and nuclear contamination and provide warnings to follow-on forces.

Schedule



EXECUTIVE SUMMARY PRODUCED BY JSCBIS

UNCLASSIFIED

NBCRSBLKII - RECON SYSTEM, FOX (NBCRS) BLOCK II

UNCLASSIFIED

System Description

MISSION

- To locate, mark, and report Nuclear, Biological and Chemical (NBC) contamination.

CHARACTERISTICS/DESCRIPTION

- Wheeled, light-armored nuclear, chemical, and biological detection vehicle
- Air Transportability - C141/C5A/C-130

CAPABILITY/IMPROVEMENTS

- Added biological detection
- Improved nuclear and chemical detection
- On-the-move stand-off chemical vapor detection
- On-the-move meteorological sensor
- Improved digital integration w/ situational awareness software

SPECIAL FEATURES

- Chemical/Biological Mass Spectrometer
- Digital sensor suite
- Stand-off chemical vapor detector on the move
- Meteorological sensor on the move

CONTRACTORS

- To be Selected

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE		5.7	11.0	12.6	3.8						33.2
PROC					5.5	34.3	35.4	35.0	1.0		111.2
TOTAL		5.7	11.0	12.6	9.4	34.3	35.4	35.0	1.0		144.4
QTY					2	16	15	16			49

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE		5.6	10.7	12.7	3.7						32.7
PROC					5.6	24.5	25.6	25.2	1.0		81.9
TOTAL		5.6	10.7	12.7	9.2	24.5	25.6	25.2	1.0		114.7
QTY					2	17	22	19			60
PGM Chg		(0.1)	(0.3)	0.1	(0.1)	(9.8)	(9.8)	(9.8)			(29.8)

Notes
FY00 program adjustment after 30 Sep 99.
FY01 zero sum to JSAM per POM meeting 11 Mar 99.
FY02 zero sum from JSAM per POM meeting 11 Mar 99.

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 123
Joint Acq Objective: 120
QTY Through FY07: 60

O&O/ORD

Unit	ORG	QTY
USACMLS	USA	8
68th/Hood	USA	6
4th ID/Hood	USA	6
44th/Hood	USA	8
92/Steward	USA	6
	USMC	8
89th/Carson	USA	6
FORSCOM	USA	36
EUSA	USA	6
USAREUR	USA	12

Fielding

- FUE 1Q FY05

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	1348.466
Program Acq Cost	1894.016
Quantity	60

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	32.7
Procurement	81.9
Total Program	114.7

Current Status

- **DOD POSITION**
  - Supports the Defense Modernization Objective.
- **FIELDING**
  - N/A
- **QUANTITY**
  - N/A
- **PROCUREMENT** - N/A
- **FMS**
  - N/A
- **MODIFICATIONS**
  - N/A
- **ISSUES**
  - N/A

1 FEB 2001
SAAL-ZCS PAUL LANGE (703) 604-7245
DAMO-FDB COL IZZO (703) 695-3089

NBCRSBLKII - RECON SYSTEM, FOX (NBCRS) BLOCK II

UNCLASSIFIED

Congressional / OSD Issues

- None

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE							
Proc							
Total							

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

SASC: Mr. Joe Sixeas
- No Language

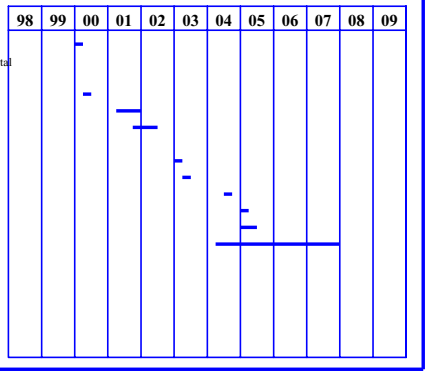
SAC-D: Mr. John Young
- No Language

Conf
- No Language

Conf
- No Language

Notes

Schedule



ABPDS - PORTAL SHIELD - AIR BASE / PORT DETECTOR SYSTEM

UNCLASSIFIED

1 FEB 2001
SAAL-ZCS PAUL LANGE (703) 604-7245
DAMO-FDB COL IZZO (703) 695-3089

System Description

MISSION

- Provide CENTCOM and PACOM CINC sponsors a "smart" network of biological detection sensors to provide force protection and protect high value fixed site assets (air and port facilities).

CHARACTERISTICS/DESCRIPTION

- Automated BW perimeter detection system
- Automated NBC warning and reporting
- Fixed site protection
- Capable of rapid deployment

CAPABILITY/IMPROVEMENTS

- Network detect to alarm requires less than 25 minutes
- Identifies up to eight BW agents
- Significantly reduced false positives
- Utility and generator power capability

SPECIAL FEATURES

- Chemical point detection interface capability
- Smart network to reduce consumables
- BW Contamination Detection Sampling Kits
- Unmasking procedures/guide

CONTRACTORS

- Sentel, Alexandria, VA
- MDL Fabrication, White Plains, MD
- Kuchera Industries, Johnstown, PA
- Met One, Grants Pass, OR
- Carlson Technology, Inc., Livonia, MI
- BETAC, Alexandria, VA
- Camber Corp. Inc., Washington, DC

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	18.2	2.8									21.0
PROC	14.6	3.9	24.7	3.9							47.1
TOTAL	32.8	6.6	24.7	3.9							68.0
QTY	70		97								167

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	18.2	2.7									20.9
PROC	14.6	4.8	26.3	3.9							49.5
TOTAL	32.8	7.5	26.3	3.9							70.4
QTY	70		97								167
PGM Chg		0.8	1.6								2.4

Notes
FY98 - Funding from JPO-BD, CPSP, and DUSD (AT). FY99 - $15.5M from JPO-BD and DUSD (AT). PDM I - Adds FY01 - $21.0M; FY02 - $9.0M for a total of 14 additional sites. Funds procure 70 systems in FY99 and 97 in FY01. FY00/02 funds system fielding support.

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 0
Joint Acq Objective: 0
QTY Through FY07: 167

O&O/ORD

Unit	ORG	QTY

Fielding

- 2 ACTD systems CENTCOM
- 2 ACTD systems PACOM (USFK AO)
- 3 Prod Systems CENTCOM AOR
- 2 Prod systems PACOM (USFK AO)

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	296.538
Program Acq Cost	421.814
Quantity	167

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	20.9
Procurement	49.5
Total Program	70.4

Current Status

- **DOD POSITION**
  - ABPDS Portal Shield is a high priority program and is considered essential for force protection.
  - The ABPDS is currently operating in Korea and South West Asia and was deployed to Kuwait to support Operation Desert Thunder.
- **FIELDING**
  - FY99 ACTD residual consists of four network systems containing a total of 70 systems. CLS support of these four established systems will continue for the entirety of FY00 and FY01.
- **QUANTITY** - N/A
- **PROCUREMENT**
  - 97 sensors (production); 70 sensors (ACTD); production of Directed Buy Sensors complete.
- **FMS** - N/A
- **MODIFICATIONS**
  - Chemical add-on capability interface and demonstration completed in FY98. UV Particle Counter (Canadian FLAPS) integration tested June 2000 and January 2001.
- **ISSUES**
  - Fourteen additional sites have been directed by the DEPSECDEF for PACOM and CENTCOM CINCs. Funds for these systems were provided with the FY99 PDM plus up.

ABPDS - PORTAL SHIELD - AIR BASE / PORT DETECTOR SYSTEM

UNCLASSIFIED

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DAMO-FDB COL IZZO (703) 695-3089

Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE							
Proc							
Total							

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

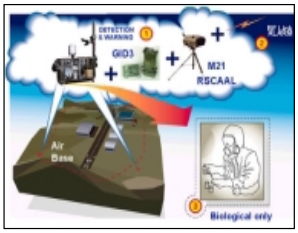
SASC: Mr. Joe Sixeas
- No Language

SAC-D: Mr. John Young
- No Language

Conf
- No Language

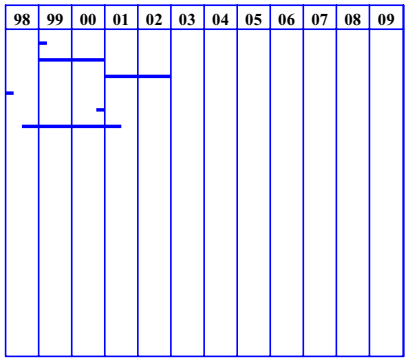
Conf
- No Language

Notes



The Air/Base Port ACTD will evaluate the military utility of a biological detection capability and develop operational procedures associated with that capability. It will also provide a residual capability to detect/warn/dewarn and presumably identify against a biological warfare attack on an air base or port facility.

Schedule



BIDS - BIOLOGICAL INTEGRATED DET SYSTEM (BIDS)

UNCLASSIFIED

1 FEB 2001
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DAMO-FDB COL IZZO (703) 695-3089

System Description

MISSION

- Detect and identify large-area Biological Warfare agent attacks; provide a basis for large-area protection and warning.

CHARACTERISTICS/DESCRIPTION

- Land based Bio-detection with two Models: NDI and P3I
- Mobile BIDS NDI detects 4 BW agents (8 for P3I); detects and identifies agents containing 25 air containing particles per liter of air (ACPLA) in 45 minutes (30 minutes for P3I).
- NDI/P3I mission capable in 30 minutes on site arrival and operates on standard military generators

CAPABILITY/IMPROVEMENTS

- BIDS NDI:
  - Detect: 25 ACPLA/25 min
  - Identify: 25 ACPLA/30 min
  - Sampling: manual
- BIDS P3I:
  - Detect: 15 ACPLA/10 min
  - Identify: 15 ACPLA/20 min
  - Sampling: automatic

SPECIAL FEATURES

- Dedicated heavy HMMWV (M1097)
- Lightweight shelter (S788) -- environmental control unit with collective protection
- Suite: Multicomplimentary bio-detection technologies
- HV and VHF radios, MET station, GPS

CONTRACTORS

- Marion Composites, Brunswick, VA
- Harris Inc., Rochester, NY
- BioRad Inc., Herculers, CA
- Bruker Inc., Billerica, MA
- Env Tech Group (ETG), Baltimore, MD
- PEM, TSI, New Brighton, MN

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	44.4										44.4
PROC	72.0	19.3									91.3
TOTAL	116.4	19.3									135.7
QTY	63	20									83

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	44.4										44.4
PROC	72.0	14.6	33.3	55.4							175.3
TOTAL	116.4	14.6	33.3	55.4							219.8
QTY	63	20									83
PGM Chg		(4.7)	33.3	55.4							84.0

Notes

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 124
Joint Acq Objective: 124
QTY Through FY07: 83

O&O/ORD

Unit	ORG	QTY
310th Chem	USA	38
7th Chem C	USA	38
USACMLS	USA	7

Fielding

- NDI - FUE 4QFY96
  FP1: 38 - 310th Chem. Co.; 3 - USACMLS (training)
- P3I - FUE 4QFY99
  FP1: 38 - 7th Chem. Co.; 4 - USACMLS (training)

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	2112.626
Program Acq Cost	2647.626
Quantity	83

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	44.4
Procurement	175.3
Total Program	219.8

Current Status

- **DOD POSITION** - N/A
- **FIELDING**
  - NDI fielded since 4QFY96 to USARC (121st ARCOM). P3I currently fielded in FY99 -- FORSCOM.
- **QUANTITY** - N/A
- **PROCUREMENT**
  - Procured 41 BIDS NDI; 38 fielded to USARC and 3 to TRADOC training base. Commenced procurement of 42 P3I BIDS; 38 fielded to FORSCOM and 4 to TRADOC between FY98-99.
- **FMS**
  - None
- **MODIFICATIONS**
  - BIDS P3I will identify any 8 BW agents on the International Cooperative Agreements -- Annex A6, and have semi-automated detection and identification capability.
- **ISSUES**
  - None

EXECUTIVE SUMMARY PRODUCED BY JSCBIS

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BIDS - BIOLOGICAL INTEGRATED DET SYSTEM (BIDS)

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Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE							
Proc							
Total							

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

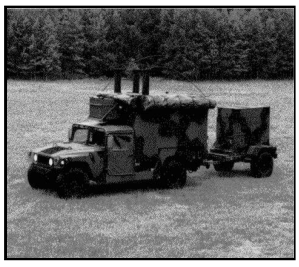
SASC: Mr. Joe Sixeas
- No Language

SAC-D: Mr. John Young
- No Language

Conf
- No Language

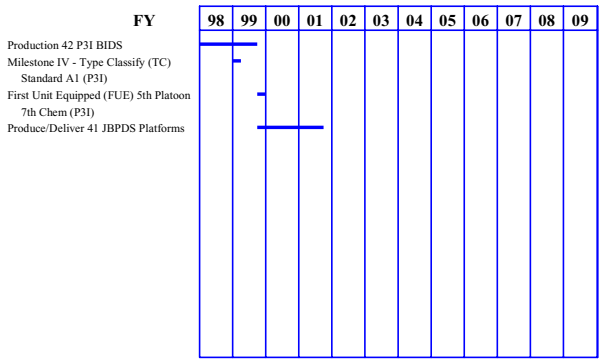
Conf
- No Language

Notes



BIDS is a vehicle-mounted, fully integrated biological detection system. It consists of a shelter (S788) equipped with a suite of complementary biological detection technologies and is mounted on a M1097 HMMWV.

Schedule



EXECUTIVE SUMMARY PRODUCED BY JSCBIS

UNCLASSIFIED

CRP - CRITICAL REAGENTS PROGRAM

UNCLASSIFIED

System Description

MISSION

- To provide reagents (e.g., antibodies and gene probes/primers and target agents and interferents) that are critical to the successful development, test and operation of biological warfare detection systems and medical biological products; manage the Handheld Immunochromatographic Assay (HHA) production effort and biological sampling kits.

CHARACTERISTICS/DESCRIPTION

- Ensures the availability of quality reagents for total system life-cycle development and maintenance
- Ensures standardization and security

CAPABILITY/IMPROVEMENTS

- Coordinated, resourced development and production of critical reagents
- Provides cost savings through volume production
- Ensures Joint Service requirements are met

SPECIAL FEATURES

- Centralized management
- Establishes and maintains qualified, secure critical reagent repositories
- Provides best reagents for all biological warfare detectors

CONTRACTORS

- Soldier Biological Chemical Command (SBCCOM), Edgewood, MD
- US Army Dugway Proving Ground, UT
- National Micrographics Systems, Columbia, MD
- Naval Medical Research Center, Bethesda, MD
- US Army Medical Research Institute for Infectious Diseases (USAMRIID), Ft. Detrick, MD

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	6.6	3.4	1.5	1.5	1.1	1.1	1.2	1.3	1.3	Cont.	Cont.
PROC	1.7	2.4	1.9	1.9	2.0	1.8	1.9	2.3	2.3	Cont.	Cont.
TOTAL	8.3	5.8	3.4	3.4	3.2	3.0	3.1	3.5	3.6	Cont.	Cont.
QTY											

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	6.6	3.3	1.5	1.1	1.1	1.1	1.6	1.8	2.3	Cont.	Cont.
PROC	1.7	2.4	2.3	1.9	2.0	1.9	1.9	2.3	2.3	Cont.	Cont.
TOTAL	8.3	5.7	3.8	3.1	3.1	2.9	3.5	4.1	4.7	Cont.	Cont.
QTY											
PGM Chg		(0.1)	0.3	(0.4)			0.4	0.5	1.1		

Notes
FY02-05 quantities are 62 per year. FY99-01 quantity is 130. Quantities in P-Forms are incorrect.

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 0
Joint Acq Objective: 0
QTY Through FY07: 0

O&O/ORD

Unit	ORG	QTY
IBADS	USA	25
BIDS	USA	76
JBPDS	USA	830
ABPDS	USA	250

Fielding

- 252 grams (G) of antibody for 14 agents/yr in FY99-00; 126 G of Ab for five agents/yr in FY01-05.
- Gene probes/primers for 10-12 agents in FY99-00 and three/yr in FY01-05.
- Target agents for dev/prod

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	None
Program Acq Cost	None
Quantity	None

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	20.4
Procurement	18.8
Total Program	39.2

Current Status

- **DOD POSITION** - N/A
- **FIELDING**
  - Critical reagents are developed and deployed in accordance with a prioritization plan that meets the needs of the supported biological warfare detection systems dependent on future funding.
- **QUANTITY**
  - Quantities through FY05 is 378.
- **PROCUREMENT**
  - Production underway for 10 BW agents and four stimulants.
- **FMS**
  - HHA FY98 FMS sales totaled $48.3K. FY99 FMS sales totaled $101.5K. Expected annual sales to Canada and United Kingdom of $100K .
- **MODIFICATIONS**
  - N/A.
- **ISSUES**
  - None.

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CRP - CRITICAL REAGENTS PROGRAM

UNCLASSIFIED

Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE							
Proc							
Total							

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

SASC: Mr. Joe Sixeas
- No Language

SAC-D: Mr. John Young
- No Language

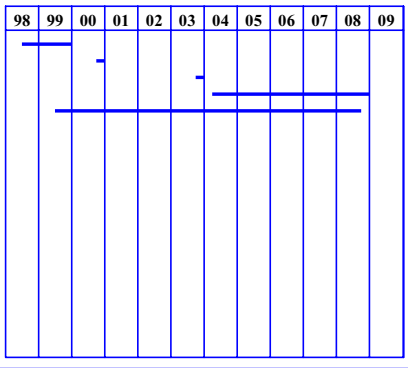
Conf
- No Language

Conf
- No Language

Notes

The critical reagents program will ensure the quality and availability of reagents that are critical to the successful development, test, and operation of biological warfare detection systems and medical biological products managed by JPM-BD.

Schedule



IBADS - INTERIM BIO AGENT DETECTOR SYS (IBADS)

UNCLASSIFIED

System Description

MISSION

- Shipboard detection, warning and presumptive identification of biological warfare (BW) agents.

CHARACTERISTICS/DESCRIPTION

- Automatically detects real-time changes in background for initial BW alarm and sample collection
- 20 min from detection to identification/alarm
- Manual ID of BW agents
- Mission-capable < 20 min

CAPABILITY/IMPROVEMENTS

- Defense against BW agents
- Immediate support to contingency deployments
- Responsive support to ships

SPECIAL FEATURES

- Shipboard mounted and detects/classifies BW agents using flow-through assays
- Integrates with Ship Survivability System
- Samples collected for lab verification
- Expandable for ID of all BW agents

CONTRACTORS

- ATR, Baltimore, MD
- STC, Hampton, VA
- Sentel, VA

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	2.3	0.3	0.3	0.3	0.3	0.3	0.3				4.3
PROC											
TOTAL	2.3	0.3	0.3	0.3	0.3	0.3	0.3				4.3
QTY											

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	2.3	0.3	0.3	0.3	0.3	0.3	0.3				4.2
PROC											
TOTAL	2.3	0.3	0.3	0.3	0.3	0.3	0.3				4.2
QTY											

PGM Chg (0.1)

Notes
JAO is to acquire 20 Rapid Prototypes (Interim Systems) - 15 shipboard systems fielded with five additional systems available for contingency operations

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 0
Joint Acq Objective: 0
QTY Through FY07: 0

O&O/ORD

Unit	ORG	QTY

Fielding

- 20 interim systems fielded
- Available - CINCs to prioritize
- 1 system per surface combatant as required by CINC
- 1 system at Navy Detachment Ft. McClellan for training

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	None
Program Acq Cost	None
Quantity	None

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	4.2
Procurement	0.0
Total Program	4.2

Current Status

- **DOD POSITION**
  - Program managed by Joint Program Office for Biological Defense and has full DoD support.
- **FIELDING**
  - 15 IBADs fielded; 5 additional available for fielding in contingency operations.
- **QUANTITY**
  - FY99 - RDT&E - $.2M - Complete ship installation/maintenance. FY00-05 - $0.3M per year for maintenance of systems.
- **PROCUREMENT**
  - None (Rapid prototype).
  - The actual Quantity through FY05 is 20 systems and will be corrected during next cycle.
- **FMS**
  - None
- **MODIFICATIONS**
  - None
- **ISSUES**
  - None

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IBADS - INTERIM BIO AGENT DETECTOR SYS (IBADS)

UNCLASSIFIED

Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE							
Proc							
Total							

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

SASC: Mr. Joe Sixeas
- No Language

SAC-D: Mr. John Young
- No Language

Conf
- No Language

Conf
- No Language

Notes

Schedule

FY	98	99	00	01	02	03	04	05	06	07	08	09
Fielding Support												

JBPDS - JOINT BIO POINT DETECTION SYSTEM (JBPDS)

UNCLASSIFIED

1 FEB 2001
SAAL-ZCS PAUL LANGE (703) 604-7245
DAMO-FDB COL IZZO (703) 695-3089

System Description

MISSION

- To detect, identify, and warn of biological warfare threat to enhance the survivability of U.S. Forces.

CHARACTERISTICS/DESCRIPTION

- Modular Bio point detection suite integrated on to Service platforms
- Detect/identify all threat agents on International Task Force-6 Rpt, (2/90)
- <2% probability of false positive ID

CAPABILITY/IMPROVEMENTS

- Evolutionary acquisition approach to replace IBAD and BIDS systems
- Point detection capability for all Services
- Identify BW agent within 15 min or less after detection
- Increased reliability and maintainability

SPECIAL FEATURES

- Fully automated detection and identification operation
- Interface with GPS communications and Joint Warning and Reporting System
- Vehicle mounted, stationary, and man portable variants

CONTRACTORS

- Intellitec, Deland, FL
- Battelle, Columbus, OH

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	68.9	22.4									91.3
PROC		22.6	53.6	61.7	91.5	59.4	46.2				335.0
TOTAL	68.9	45.0	53.6	61.7	91.5	59.4	46.2				426.3
QTY		25	143	163	250	151	111				843

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	64.6	21.3	5.3								91.2
PROC		17.1	28.9	38.6	94.9	75.8	74.5				329.7
TOTAL	64.6	38.4	34.2	38.6	94.9	75.8	74.5				420.9
QTY		4	5	16	194	157	160				536
PGM Chg	(4.3)	(6.6)	(19.4)	(23.1)	3.4	16.4	28.3				(5.4)

Notes
FY99 zero sum move to JBDPS Block II. FY00 reprogramming - RDTE transfer-in from Decon, Vaccines and Contamination Avoidance and Proc transfer-out to Vaccines. FY01/02 zero sum moves to JBDPS Block II and TT Bio.

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 1725
Joint Acq Objective: 2156
QTY Through FY07: 536

O&O/ORD

Unit	ORG	QTY
All	USA	456
All	USN	103
All	USAF	313
All	USMC	99

Fielding

- LRIP 1Q01
- FUE - 3QFY03

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	615.188
Program Acq Cost	785.300
Quantity	536

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	91.2
Procurement	329.7
Total Program	420.9

Current Status

- **DOD POSITION** - N/A
- **FIELDING** - N/A
- **QUANTITY** - N/A
- **PROCUREMENT**
  - Entered LRIP.
- **FMS**
  - None
- **MODIFICATIONS**
  - None
- **ISSUES**
  - POM issues: FY02 The re-baselined program requires less funding due to 12 month test assessment & contract solicitation added between OA & operational test & full production moved to FY03.
  - FY04-FY07: Re-baselined program requires more funding than what was previously budgeted to re-coup money lost in FY00-02 & to buy Acquisition Objective of 971 systems.

JBPDS - JOINT BIO POINT DETECTION SYSTEM (JBPDS)

UNCLASSIFIED

1 FEB 2001
SAAL-ZCS PAUL LANGE (703) 604-7245
DAMO-FDB COL IZZO (703) 695-3089

Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE							
Proc							
Total							

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

SASC: Mr. Joe Sixeas
- No Language

SAC-D: Mr. John Young
- No Language

Conf
- No Language

Conf
- No Language

Notes

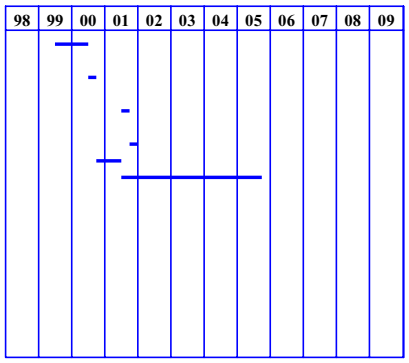
The JBPDS is organized into a 2 block program. The Block 1 effort acquisition objective is 971 systems. The Block 2 Acquisition Objective is 1185.

The JBPDS program went on DOT&E oversight February 2000.

The JBPDS program was elevated to ACAT II in September 2000.

JBPDS is the developmental system that will replace all existing NDI systems and provide biological detection capabilities throughout the services. The common biological detection suite will detect, collect samples of, and identify BW agents.

Schedule



JBPDSBLK2 - JOINT BIO POINT DETECTOR SYSTEM BLK 2

UNCLASSIFIED

System Description

MISSION

- To detect, identify, and warn of biological warfare threat to enhance the survivability of U.S. forces.

CHARACTERISTICS/DESCRIPTION

- Replaces JBPDS BLK I

CAPABILITY/IMPROVEMENTS

- Increased specificity
- Increased sensitivity
- Increase in number of agent identifications
- Reduction in weight
- Reduced detection time
- Reduction in size

SPECIAL FEATURES

CONTRACTORS

- TBD

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	1.8		4.5	20.6	27.7	14.2					68.8
PROC								44.0	64.0	Cont.	Cont.
TOTAL	1.8		4.5	20.6	27.7	14.2		44.0	64.0	Cont.	Cont.
QTY								122	178	Cont.	Cont.

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	3.8		1.2	16.7	19.7	19.3	14.5				75.2
PROC								44.4	64.7	Cont.	Cont.
TOTAL	3.8		1.2	16.7	19.7	19.3	14.5	44.4	64.7	Cont.	Cont.
QTY								122	178	Cont.	Cont.
PGM Chg	2.0		(3.3)	(3.9)	(8.0)	5.1	14.5	0.4	0.7		

Notes

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 1960
Joint Acq Objective: 1960
QTY Through FY07: 300

O&O/ORD

Unit	ORG	QTY
All	USA	624
All	USN	320
All	USAF	997
All	USMC	113

Fielding

- Full Production FY00
- IOC - 4QFY01
- FOC - FY05
- Special Operation Forces - 29

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	364.295
Program Acq Cost	981.090
Quantity	122

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	75.2
Procurement	109.1
Total Program	184.4

Current Status

- **DOD POSITION** - N/A
- **FIELDING** - N/A
- **QUANTITY** - N/A
- **PROCUREMENT** - N/A
- **FMS** - N/A
- **MODIFICATIONS** - N/A
- **ISSUES** - N/A

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JBPDSBLK2 - JOINT BIO POINT DETECTOR SYSTEM BLK 2

UNCLASSIFIED

Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE							
Proc							
Total							

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

SASC: Mr. Joe Sixeas
- No Language

SAC-D: Mr. John Young
- No Language

Conf
- No Language

Conf
- No Language

Notes

Schedule

FY	98	99	00	01	02	03	04	05	06	07	08	09

1 FEB 2001
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System Description

MISSION

- To transition Biological Detection technology from the DoD/DARPA/DOE Tech Base to advanced development.

CHARACTERISTICS/DESCRIPTION

- Evolutionary upgrades to fielded and emerging Biological Detection Systems
- Rapid prototyping and integration
- Joint Field Trial (JFT) evaluation

CAPABILITY/IMPROVEMENTS

- Faster detection
- Reduced total ownership costs (Reduced Consumables)
- Shortened acquisition cycle times
- Reduced false positives
- Increased sensitivity and specificity of reagents

SPECIAL FEATURES

- Early focus on: Collector/Concentrators; Generic detectors; Early warning; and Critical Reagents
- Consolidation of TT Bio R&D funds.

CONTRACTORS

- General Dynamics, Falls Church, VA
- Midwest Research Institute (MRI), Kansas City, MO
- John Hopkins Applied Physics Lab, Baltimore, MD

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE		2.4	6.6	10.6	15.4	20.4	11.6	2.4	2.3	Cont.	Cont.
PROC											
TOTAL		2.4	6.6	10.6	15.4	20.4	11.6	2.4	2.3	Cont.	Cont.
QTY											

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE		0.9	3.4	1.6	0.7			2.4	2.3		11.3
PROC											
TOTAL		0.9	3.4	1.6	0.7			2.4	2.3		11.3
QTY											
PGM Chg		(1.4)	(3.2)	(9.0)	(14.8)	(20.4)	(11.6)				

Notes
FY00 congressional plus up. FY01/02/03 zero sum program moves from JBPDS.

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 0
Joint Acq Objective: 0
QTY Through FY07: 0

O&O/ORD

Unit	ORG	QTY

Fielding

- NA

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	None
Program Acq Cost	None
Quantity	None

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	11.3
Procurement	0.0
Total Program	11.3

Current Status

- **DOD POSITION** - N/A
- **FIELDING** - N/A
- **QUANTITY** - N/A
- **PROCUREMENT** - N/A
- **FMS** - N/A
- **MODIFICATIONS** - N/A
- **ISSUES** - N/A

TT Bio - TECHNOLOGY TRANSFER FOR BIO SENSORS
UNCLASSIFIED

1 FEB 2001
SAAL-ZCS PAUL LANGE (703) 604-7245
DAMO-FDB COL IZZO (703) 695-3089

Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE						0.2	
Proc							
Total						0.2	

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

SASC: Mr. Joe Sixeas
- No Language

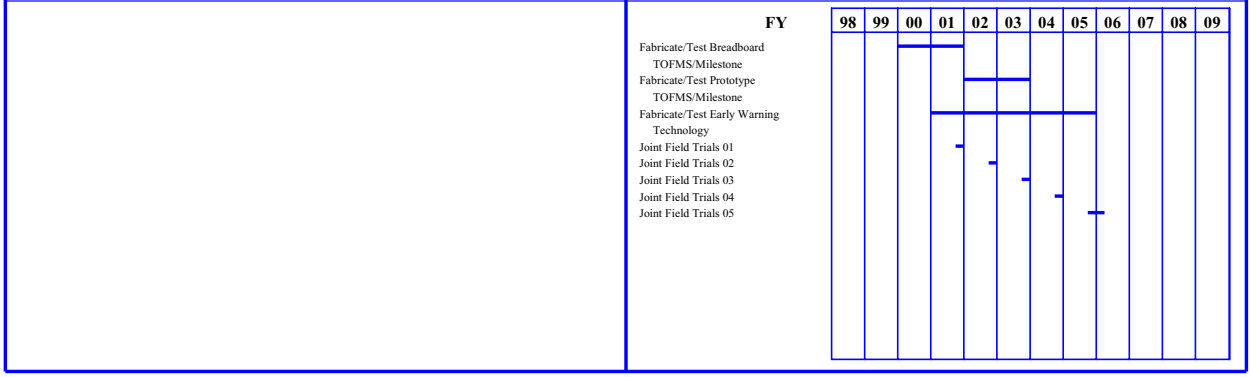
SAC-D: Mr. John Young
- No Language

Conf
- No Language

Conf
- No Language

Notes

Schedule



AERP - AIRCREW EYE RESPIRATORY PROTECTION (AERP)

UNCLASSIFIED

System Description

MISSION

- Protective mask to be used by Air Force aircrews while conducting mission operations in a chemical/biological environment

CHARACTERISTICS/DESCRIPTION

- Includes a standard MBU-12/P mask, with an integral hood, a blower assembly to provide clean air, an eye lens demist, and an intercom for ground communication

CAPABILITY/IMPROVEMENTS

- Valsalva capablity, drinking tube, larger field of view
- Incorporates passive anti-down device (PADD) for eject seat aircraft
- Compatible with other NATO life-support equipment

SPECIAL FEATURES

- Integrated mask/hood
- Oxygen system compatible

CONTRACTORS

- ILC Dover (Mask/Hood MEQ)
- Allied Materials and Company, Inc. (Mask/Hood)
- Hunter, Inc (Blower)
- Primetec (Intercom)

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	1.3										1.3
PROC	3.1										3.1
TOTAL QTY	4.4										4.4

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	1.3										1.3
PROC	3.1		1.5	1.8	1.8						8.2
TOTAL QTY	4.4		1.5	1.8	1.8						9.5
PGM Chg			1.5	1.8	1.8						5.1

Notes

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 4144
Joint Acq Objective: 4144
QTY Through FY07: 0

O&O/ORD		
Unit	ORG	QTY

Fielding

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	None
Program Acq Cost	None
Quantity	None

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	1.3
Procurement	8.2
Total Program	9.5

Current Status

- **DOD POSITION**
  - USAF sole used of AERP mask program
- **FIELDING**
  - Over 78% fielded
- **QUANTITY** - N/A
- **PROCUREMENT**
  - Allied has produced AERP system and will complete remaining AERPs prior to SEP99. Conax is the contractor producing the PADD with final delivery scheduled for JAN99
- **FMS**
  - None
- **MODIFICATIONS**
  - Each aircraft requiring aircrew C/B protection shall be modified to support AERP
  - Armor Quick Disconnect TCTO to mask/hood system
  - PADD safety enhancement to inital procurements (IOT&E identified)
- **ISSUES**
  - Hazard classification required prior to PADD being released to the field

1 FEB 2001
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AERP - AIRCREW EYE RESPIRATORY PROTECTION (AERP)

UNCLASSIFIED

Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE							
Proc							
Total							

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

SASC: Mr. Joe Sixeas
- No Language

SAC-D: Mr. John Young
- No Language

Conf
- No Language

Conf
- No Language

Notes

Schedule

FY	98	99	00	01	02	03	04	05	06	07	08	09

1 FEB 2001
SAAL-ZCS PAUL LANGE (703) 604-7245
DAMO-FDB COL IZZO (703) 695-3089

System Description

MISSION

- Protective mask that helps Air Force aircrews to conduct mission operations in a chemical/biological environment.

CHARACTERISTICS/DESCRIPTION

- Includes a standard MBU-12/P mask, with an integral hood, a blower assembly to provide clean air and eye lens, demist and an intercom for ground communication

CAPABILITY/IMPROVEMENTS

- Valsalva capability, drinking tube, larger field of view
- Incorporates passive anti-down device (PADD) for eject seat aircraft
- Compatible with other NATO life support equipment

SPECIAL FEATURES

- Integrated mask/hood
- Compatible with oxygen system

CONTRACTORS

- ILC Dover, DE
- Allied Materials & Company, Inc.,
- Hunter, Inc.,
- Primetec,

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	1.0	0.1	0.1	0.1	0.1						1.4
PROC	5.4	1.9	0.9	1.3	0.9						10.4
TOTAL	6.5	2.0	1.0	1.3	1.0						11.8
QTY	119	17	1	2	21						160

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	1.0	0.4	0.1	0.1	0.1						1.7
PROC	2.0		2.7	3.0	2.7						10.4
TOTAL	3.1	0.4	2.9	3.0	2.7						12.0
QTY	110		7	27	30						174
PGM Chg	(3.4)	(1.6)	1.9	1.7	1.7						0.2

Notes
Prior year funds procured 33800 AERP Masks. Quantities in Current Status below reflect modifications to aircraft.

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 0
Joint Acq Objective: 0
QTY Through FY07: 174

O&O/ORD

Unit	ORG	QTY

Fielding

- Fielded:
  33,800 mask/hoods
  33,800 blower units
  33,800 intercom units
- Fielded:
  12,625 PADDs
- 1 per Aircrew member deployed to 2 MTW scenario

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	59.672
Program Acq Cost	69.241
Quantity	174

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	1.7
Procurement	10.4
Total Program	12.0

Current Status

- **DOD POSITION** - N/A
- **FIELDING** - N/A
- **QUANTITY** - N/A
- **PROCUREMENT** - N/A
- **FMS** - N/A
- **MODIFICATIONS**
  - By FY and number of aircraft are: FY98 - 70; FY99 - 37; FY00 - 0; FY01 -9; FY02 -28; FY03 - 11
- **ISSUES** - N/A

AERPMODS - AERP AIRCRAFT MODIFICATIONS
UNCLASSIFIED

1 FEB 2001
SAAL-ZCS PAUL LANGE (703) 604-7245
DAMO-FDB COL IZZO (703) 695-3089

Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE							
Proc							
Total							

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

SASC: Mr. Joe Sixeas
- No Language

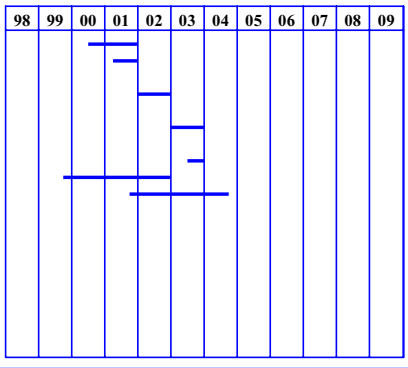
SAC-D: Mr. John Young
- No Language

Conf
- No Language

Conf
- No Language

Notes

Schedule



CBRS-AC - CB RESPER SYSTEM - AIR CREW

UNCLASSIFIED

System Description

MISSION

- Provides respiratory Chemical/Biological (CB) protection to Navy and Marine Corps aircrews in rotary wing, tactical and land-based fixed wing aircraft.

CHARACTERISTICS/DESCRIPTION

- Aircrew mounted system
- Respiratory system only
- Non-developmental item
- Four variants: Rotary Wing, Liquid Oxygen Aircraft, Onboard Oxygen
- Generating Systems Aircraft, Land-Based Aircraft

CAPABILITY/IMPROVEMENTS

- Provides Navy and Marine Corps Tactical Aircraft, Navy Rotary Wing and Navy and Marine Corps Land-Based Fixed Wings with the capability to perform missions in a CB warfare environment

SPECIAL FEATURES

- Compatible with night vision goggles
- Compatible with Naval Aviation life support systems and aircrew stations
- Ejection safe and water survivable

CONTRACTORS

- Camlock, LTD, United Kingdom

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	1.6										1.6
PROC	21.9	7.3	4.0								33.2
TOTAL	23.5	7.3	4.0								34.8
QTY	3574	1234	692								5500

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	1.6										1.6
PROC	21.9	7.3	4.0	3.9	3.2						40.2
TOTAL	23.5	7.3	4.0	3.9	3.2						41.8
QTY	3574	1234	687	666	534						6695
PGM Chg				3.9	3.2						7.0

Notes
Funding increased in FY02 and FY03 due to the slip in the planned fielding of the Joint Service Aircrew Mask Program.

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 7919
Joint Acq Objective: 7919
QTY Through FY07: 6695

O&O/ORD

Unit	ORG	QTY
All	USN	4729
All	USMC	3190

Fielding

- AIRLANT: 2000
- AIRPAC: 2000

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	6.007
Program Acq Cost	6.248
Quantity	6695

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	1.6
Procurement	40.2
Total Program	41.8

Current Status

- **DOD POSITION**
  - Respiratory protection against CB warfare agents is required for Navy and Marine Corps tactical and Navy rotary-wing aircrews to sustain warfare and flight operations while in a CB contaminated environment.
- **FIELDING**
  - Delivered units are evenly fielded between Naval Airforce U.S. Atlantic Fleet (AIRLANT) and Naval Airforce U.S. Pacific Fleet (AIRPAC).
- **QUANTITY**
  - Approximately 4000 masks fielded to date.
- **PROCUREMENT**
  - FY02 funding procures an additional 666 NDI masks.
- **FMS** - N/A
- **MODIFICATIONS** - N/A
- **ISSUES** - N/A

CBRS-AC - CB RESPER SYSTEM - AIR CREW

UNCLASSIFIED

1 FEB 2001
SAAL-ZCS PAUL LANGE (703) 604-7245
DAMO-FDB COL IZZO (703) 695-3089

Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE							
Proc							
Total							

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

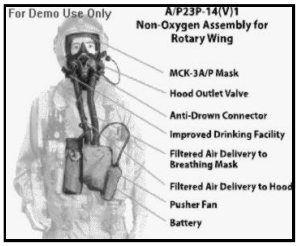
SASC: Mr. Joe Sixeas
- No Language

SAC-D: Mr. John Young
- No Language

Conf
- No Language

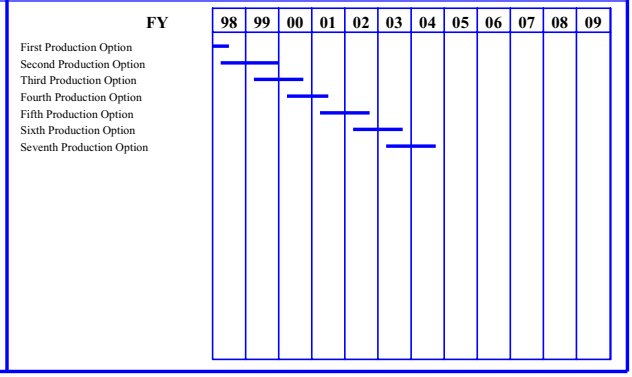
Conf
- No Language

Notes



The CB Respiratory System will incorporate a CB filter, dual air/oxygen supply and filtered air for oxygen for breathing. The system will provide enhanced protection and offer anti-drown features.

Schedule



JPACE - JOINT PROTECTIVE AIRCREW ENSEMBLE

UNCLASSIFIED

System Description

MISSION

- Provides below-the-neck (BTN) chemical/biological (CB) protection to Navy, Marine Corps, Army and Air Force aircrews.

CHARACTERISTICS/DESCRIPTION

- For use on rotary and fixed wing aircraft
- Below the neck Chemical/Biological protection for 16 hours (24 hour objective)
- Resist ignition and self extinguish if ignited
- Thermal protection for emergency egress from burning aircraft

CAPABILITY/IMPROVEMENTS

- The requirement is intended to provide an improved Chemical Biological (CB) ensemble for use by all personnel who serve as crew members on rotary and fixed wing aircraft. System will increase wear time enabling missions of longer duration to be performed.

SPECIAL FEATURES

- Compatible with aviation life-support systems
- Protect against chemical agents driven by a 100 knot vertical rotor wash (objective 130 knots)

CONTRACTORS

- TBD

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	2.6	2.4	3.7	1.7						Cont.	Cont.
PROC					21.5	21.9	21.6			Cont.	Cont.
TOTAL	2.6	2.4	3.7	1.7	21.5	21.9	21.6			Cont.	Cont.
QTY					47950	47500	47950			Cont.	Cont.

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	2.6	2.4	3.6	3.8	6.2	1.7				Cont.	Cont.
PROC						11.1	21.8	22.1	10.6	Cont.	Cont.
TOTAL	2.6	2.4	3.6	3.8	6.2	12.7	21.8	22.1	10.6	Cont.	Cont.
QTY						24314	47632	48388	23092	Cont.	Cont.
PGM Chg			(0.1)	2.2	(15.3)	(9.2)	0.2	22.1	10.6		

Notes

Program budget and schedule refined using cost data from other protective clothing programs and to reflect revisions to the operational requirements document to include two distinct mission specific ensembles.

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 125081
Joint Acq Objective: 125191
QTY Through FY07: 143426

O&O/ORD

Unit	ORG	QTY
All	USA	44444
All	USN	46472
All	USMC	25950
All	USAF	120000

Fielding

- TBD

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	0.456
Program Acq Cost	0.624
Quantity	120334

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	20.2
Procurement	65.6
Total Program	85.8

Current Status

- **DOD POSITION**
  - JPACE consolidates Navy, Air Force and Marine Corps individual protective aircrew ensemble requirements and provides the ability to fully exploit combat capabilities in a CB environment while reducing heat stress.
- **FIELDING** - N/A
- **QUANTITY** - N/A
- **PROCUREMENT**
  - JPACE will leverage Joint Service Lightweight Integrated Suit Technology (JSLIST), pre-planned product improvement (P3I), advanced material testing and technologies to maximum extent possible.
- **FMS** - N/A
- **MODIFICATIONS** - N/A
- **ISSUES** - N/A

JPACE - JOINT PROTECTIVE AIRCREW ENSEMBLE

UNCLASSIFIED

1 FEB 2001
SAAL-ZCS PAUL LANGE (703) 604-7245
DAMO-FDB COL IZZO (703) 695-3089

Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE							
Proc							
Total							

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

SASC: Mr. Joe Sixeas
- No Language

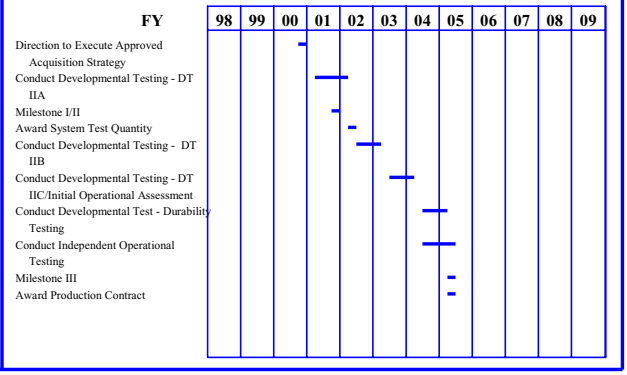
SAC-D: Mr. John Young
- No Language

Conf
- No Language

Conf
- No Language

Notes

Schedule



1 FEB 2001
SAAL-ZCS PAUL LANGE (703) 604-7245
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System Description

MISSION

- Protective mask for all aircrew members (Fixed and Rotary Wing) which protects against all known threat chemical and biological agents and radiological particles.

CHARACTERISTICS/DESCRIPTION

- Chem/Bio protection system with positive pressure breathing capabilities
- Compatible with all existing life-support equipment
- Chem/Bio portion donned in-flight
- NATO compliant

CAPABILITY/IMPROVEMENTS

- Increased Chem/Bio protection
- Increased field of view
- Improved heat stress

SPECIAL FEATURES

- Chem/Bio and Anti-G protection for fighter aircrews
- Donned/doffed in-flight
- Improved reliability
- Used during escape and evasion

CONTRACTORS

- Gentex Western Operations - Rancho Cucamonga, CA
- SAIC - Abingdon, MD

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE		4.6	8.1	7.3	7.8	9.1					36.9
PROC						7.2	14.8	11.0	11.0	Cont.	Cont.
TOTAL		4.6	8.1	7.3	7.8	16.3	14.8	11.0	11.0	Cont.	Cont.
QTY						2626	5200	3816	3816	Cont.	Cont.

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE		4.5	7.9	11.7	11.8	15.6	9.8				61.3
PROC								11.1	11.1	Cont.	Cont.
TOTAL		4.5	7.9	11.7	11.8	15.6	9.8	11.1	11.1	Cont.	Cont.
QTY								3816	3816	Cont.	Cont.
PGM Chg		(0.1)	(0.2)	4.5	4.0	(0.7)	(5.0)	0.1	0.1		

Notes
FY01 zero sum from NBCRS Blk II per POM meeting 11 Mar 99.
FY02 zero sum to NBCRS Blk II per POM meeting 11 Mar 99.
FY04 POM will restructure program.

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 65624
Joint Acq Objective: 65729
QTY Through FY07: 7632

O&O/ORD

Unit	ORG	QTY
All	USA	15290
All	USAF	30879
All	USN	9388
All	USMC	11072

Fielding

- FUE 2Q FY06

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	2.911
Program Acq Cost	18.972
Quantity	3816

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	61.3
Procurement	22.2
Total Program	83.5

Current Status

- **DOD POSITION**
  - Replaces current aviation masks for Army, USAF, Navy and USMC.
- **FIELDING** - N/A
- **QUANTITY** - N/A
- **PROCUREMENT** - N/A
- **FMS** - N/A
- **MODIFICATIONS**
  - No aircraft modifications are anticipated. There may be minor modifications to life support equipment.
- **ISSUES** - N/A

JSAM - JS AIRCREW MASK (JSAM)
UNCLASSIFIED

1 FEB 2001
SAAL-ZCS PAUL LANGE (703) 604-7245
DAMO-FDB COL IZZO (703) 695-3089

Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE							
Proc							
Total							

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

SASC: Mr. Joe Sixeas
- No Language

SAC-D: Mr. John Young
- No Language

Conf
- No Language

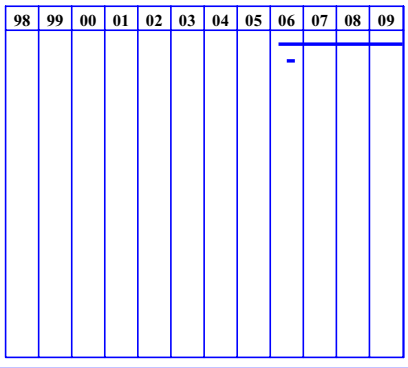
Conf
- No Language

Notes

* Production will slip by one year.

The JSAM will be a lightweight, CB protective mask that can be worn as CB protection for all aircrew. With the addition of anti-G features, it can be worn as combined CB and anti-G protection by aircrew in high-performance aircraft.

Schedule



JSGPM - JS GENERAL PURPOSE MASK

UNCLASSIFIED

System Description

MISSION

- To provide Joint Service personnel a general-purpose protection mask system that provides chemical, biological, toxin, radioactive particulate, and toxic industrial material protection.

CHARACTERISTICS/DESCRIPTION

- Lighter, less bulky
- Provides improved protection compared to existing masks
- Will replace the M40, M40A1, M42, M42A1, M42A2, MCU-2/P and MCU-2A/P masks currently used by the Services

CAPABILITY/IMPROVEMENTS

- Program Goals:
  - 50% bulk weight reduction
  - 50% breathing resistance reduction
  - improved comfort
  - improved protection (includes toxic industrial material)

SPECIAL FEATURES

- New filter for physiological & filtration requirements
- Improved systems compatibility: close-in eyelenses; conformal face piece; field of view; and speech transmission
- Cost allows potential for disposal after agent exposure

CONTRACTORS

- Avon Rubber and Plastics Inc., Cadillac, MI

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	3.5	6.5	9.2	11.0	12.0	12.7					54.8
PROC							15.8	19.0	19.1	Cont.	Cont.
TOTAL	3.5	6.5	9.2	11.0	12.0	12.7	15.8	19.0	19.1	Cont.	Cont.
QTY							170000	201627	214497	Cont.	Cont.

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	3.5	6.4	9.0	13.5	13.6	14.0					60.1
PROC							16.0	19.1	19.3	Cont.	Cont.
TOTAL	3.5	6.4	9.0	13.5	13.6	14.0	16.0	19.1	19.3	Cont.	Cont.
QTY							170000	201627	214497	Cont.	Cont.
PGM Chg		(0.1)	(0.2)	2.6	1.6	1.3	0.1	0.2	0.2		

Notes

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 1796879
Joint Acq Objective: 2718349
QTY Through FY07: 586124

O&O/ORD

Unit	ORG	QTY
1/soldier	USA	738854
1/airman	USAF	452438
1/seaman	USN	333000
1/marine	USMC	272762

Fielding

- FUE - 4Q FY06

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	0.094
Program Acq Cost	0.256
Quantity	371627

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	60.1
Procurement	54.4
Total Program	114.4

Current Status

- **DOD POSITION**
  - JSGPM replaces existing mask systems (M40/M42 and MCU-2/P series) at the end of their 10-15 year service life.
- **FIELDING**
  - FUE- 4Q FY06.
- **QUANTITY** - N/A
- **PROCUREMENT** - N/A
- **FMS** - N/A
- **MODIFICATIONS**
  - N/A
- **ISSUES** - N/A

JSGPM - JS GENERAL PURPOSE MASK

UNCLASSIFIED

1 FEB 2001
SAAL-ZCS PAUL LANGE (703) 604-7245
DAMO-FDB COL IZZO (703) 695-3089

Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE							
Proc							
Total							

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

SASC: Mr. Joe Sixeas
- No Language

SAC-D: Mr. John Young
- No Language

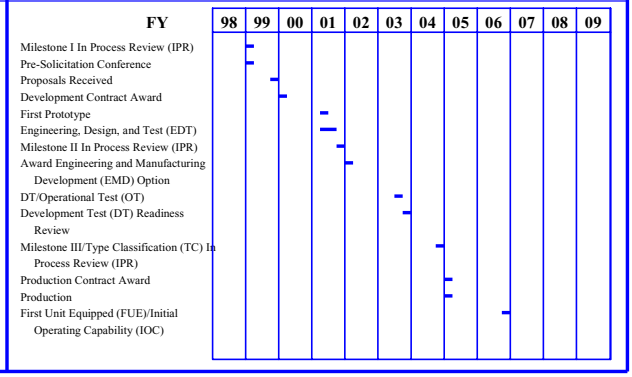
Conf
- No Language

Conf
- No Language

Notes

The JSGPM is designed to replace the M40/M42/XM45/M49/MCU-2/P masks. It will significantly reduce mission degradation and will be compatible with future equipment and soldier systems. The JSGPM will improve visual field-of-view and increase a soldier's ability to perform mission essential tasks by reducing physiological burdens. The mask will also feature reduced weight and bulk.

Schedule



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System Description

MISSION

- To provide protective mask for individual soldier (M40 Series) and armor vehicle crewman (M42 Series) protects against all known threat chemical and biological agents and radiological particulates.

CHARACTERISTICS/DESCRIPTION

- Form-fitting facepiece
- Binocular lenses
- NATO Std, external C2A1 Canister
- Front/side voicemitter (detachable microphone on M42A2)
- Quick-doff hood with second skin

CAPABILITY/IMPROVEMENTS

- Improved comfort and protection
- Greater field of view
- Improved communication
- Drinking capability (armor veh personnel)
- Maintains and improves combat readiness

SPECIAL FEATURES

- Greater flexibility and improved reliability
- Compatible with optics and night vision goggles
- Increased mask face sealing surface
- Used in surety site operations

CONTRACTORS

- ILC Dover, DE - Active
- Mine Safety Appliances, PA -- Mobilization Base

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE											
PROC	57.1	11.2	1.5	0.1							70.0
TOTAL	57.1	11.2	1.5	0.1							70.0
QTY	337298	80535									417833

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE											
PROC	57.5	13.4	1.5	0.1							72.6
TOTAL	57.5	13.4	1.5	0.1							72.6
QTY	337298	100394									437692
PGM Chg	0.4	2.2									2.6

Notes
FY01 funds system fielding support and additional purchase of Universal Second Skin component of M40 mask.
FY02 funds system fielding support.

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 989150
Joint Acq Objective: 989215
QTY Through FY07: 437692

O&O/ORD

Unit	ORG	QTY
1/Soldier	USA	807962
1/Marine	USMC	154853
All	USN	26400

Fielding

- Multiple Units

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	0.165
Program Acq Cost	0.165
Quantity	437692

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	0.0
Procurement	72.6
Total Program	72.6

Current Status

- **DOD POSITION**
  - The M40/42Series Mask is a vast improvement in protection over previous masks. It replaces legacy systems such as, M9, M25, and M17 Masks.
- **FIELDING**
  - Ongoing to Army RC units.
  - Army currently fielding Universal Second Skin
- **QUANTITY** - N/A
- **PROCUREMENT**
  - M40 Mask Program procuring universal second skin beginning in FY98 for initial issue.
- **FMS**
  - Saudi Arabia, UAE, Tunisia, Jamaica, Jordan, Bahrain, Greece, Thailand.
- **MODIFICATIONS**
  - Comfort problem with nosecup resolved through redesign and incorporation into current M40A1/M42A2 production contract.
- **ISSUES**
  - None

M40A1SM - M40A1 SERIES MASK

UNCLASSIFIED

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Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE				1.0			
Proc				1.0	1.0		1.0
Total				2.0	1.0		1.0

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No language.

SASC: Mr. Joe Sixeas
- No Language

SAC-D: Mr. John Young
- No Language

Conf
- Increase $1.0M for procurement of protective masks.

Conf
- No Language

Notes

The M40/42 protective masks provide eye-respiratory face protection from tactical concentrations of CB warfare agents, toxins, and radioactive fallout particles. The M40 is designed for the individual dismounted ground warrior, while the M42 is designed for combat vehicle crewmen.

Schedule

FY	98	99	00	01	02	03	04	05	06	07	08	09
Production												

MCU2P SS - MCU2P SECOND SKIN

UNCLASSIFIED

System Description

MISSION

CHARACTERISTICS/DESCRIPTION

- Molded rubber faceblank that will fit over the MCU-2P protective mask.

CAPABILITY/IMPROVEMENTS

- Protects mask material from agent contamination

SPECIAL FEATURES

CONTRACTORS

- American Technology Corporation, Baltimore, MD

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE											
PROC											
TOTAL											
QTY											

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE											
PROC			0.9	3.5	15.3						19.6
TOTAL			0.9	3.5	15.3						19.6
QTY			150	196812	890350						1087312
PGM Chg			0.9	3.5	15.3						19.6

Notes

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 0
Joint Acq Objective: 0
QTY Through FY07: 1087312

O&O/ORD

Unit	ORG	QTY

Fielding

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	0.018
Program Acq Cost	0.018
Quantity	1087312

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	0.0
Procurement	19.6
Total Program	19.6

Current Status

- **DOD POSITION** - N/A
- **FIELDING** - N/A
- **QUANTITY** - N/A
- **PROCUREMENT** - N/A
- **FMS** - N/A
- **MODIFICATIONS** - N/A
- **ISSUES** - N/A

EXECUTIVE SUMMARY PRODUCED BY JSCBIS

UNCLASSIFIED

MCU2P SS - MCU2P SECOND SKIN

UNCLASSIFIED

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Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE							
Proc							
Total							

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

SASC: Mr. Joe Sixeas
- No Language

SAC-D: Mr. John Young
- No Language

Conf
- No Language

Conf
- No Language

Notes

Schedule

FY	98	99	00	01	02	03	04	05	06	07	08	09

EXECUTIVE SUMMARY PRODUCED BY JSCBIS

UNCLASSIFIED

NIPG - NAVY INDIVIDUAL PROTECTIVE GEAR

UNCLASSIFIED

System Description

MISSION

- Provide updated core Chemical, Biological, Radiological (CBR) defensive capabilities to Naval Support Elements, Naval Construction Forces, Maritime Preposition Forces and Naval Overseas Shore Activity facilities and personnel.

CHARACTERISTICS/DESCRIPTION

- Initial outfitting of protective clothing, detectors, decontamination equipment, and collective protection shelters/structures designed to counter effects of CBR warfare.

CAPABILITY/IMPROVEMENTS

- Improve receiving units mission capability in a CBR threat or contaminated environment by providing detection, protection, decontamination and medical equipment.
- New equipment and systems will improve Joint Service interoperability while incorporating advanced technology to provide enhanced CBR defensive capabilities.

SPECIAL FEATURES

- Provides initial capability through initial fielding of items already in government inventory and not currently being procured by another acquisition program within the Joint Chemical/Biological Defense Program (CBDP).
- Initial outfitting not met through this program by the end of FY03 will be covered through fielding of items currently in development within the Joint CBDP.

CONTRACTORS

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE											
PROC	0.8	3.4	5.5	2.3	3.2						15.2
TOTAL	0.8	3.4	5.5	2.3	3.2						15.2
QTY											

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE											
PROC	0.8	3.4	5.4	2.3	3.2						15.1
TOTAL	0.8	3.4	5.4	2.3	3.2						15.1
QTY											

PGM Chg (0.1)

Notes

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 0
Joint Acq Objective: 0
QTY Through FY07: 0

O&O/ORD

Unit	ORG	QTY

Fielding

- Bahrain allowance increase: completed
- PACFLT/CENTCOM: Priority 1-3 completed
- OCONUS Bases/Naval Construction Forces: initiated
- Naval Special Warfare Units: initiated

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	None
Program Acq Cost	None
Quantity	None

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	0.0
Procurement	15.1
Total Program	15.1

Current Status

- **DOD POSITION**
  - CBR defensive equipment is critical for meeting identified operation deficiencies.
- **FIELDING**
  - Various Naval Construction Battallions, Naval Overseas Shore bases, Naval Construction Regiments, and Naval Construction Force Support Units.
- **QUANTITY**
  - Completed Bahrain individual protective equipment allowance increase, Pacific Fleet (PACFLT)/Central Command (CENTCOM) Priority 1-3 fielding and initiated Overseas Bases, Naval Construction Forces and Naval Special Warfare Units fielding.
- **PROCUREMENT**
  - FY02 procures 32 M-17 Lightweight Decontamination Systems, 1235 M-295 Decontamination Kits, 377 MCU-2P Masks, 1608 chemical protective overshoes and other miscellaneous detection kits and protective gear.
- **FMS** - N/A
- **MODIFICATIONS** - N/A
- **ISSUES** - N/A

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NIPG - NAVY INDIVIDUAL PROTECTIVE GEAR

UNCLASSIFIED

Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE							
Proc							
Total							

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

SASC: Mr. Joe Sixeas
- No Language

SAC-D: Mr. John Young
- No Language

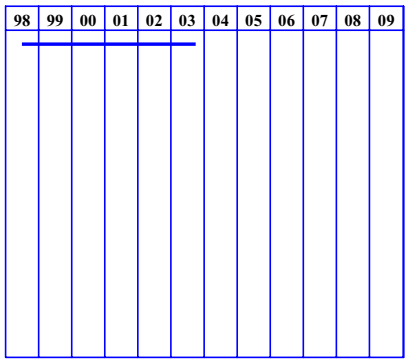
Conf
- No Language

Conf
- No Language

Notes

Procurement of antidotes, protective clothing (boots/gloves/belts), personal detection quipment, and personal decontamination equipment for Naval Support Elements, Naval Construction Forces, Maritime Prepositioned Forces and Naval Overseas Shore Activities.

Schedule



EXECUTIVE SUMMARY PRODUCED BY JSCBIS

UNCLASSIFIED

PATS - PROTECTION ASSESSMENT TEST SYSTEM (M41)

UNCLASSIFIED

System Description

MISSION

- The PATS is designed to verify that a protective mask while worn by a soldier is capable of providing a minimum Army requirement PF of 1667. The PATS verifies that; (1) the fit of the mask to the soldiers' face is acceptable, and (2) that there are no critical leaks in the mask system. In addition to these features, the PATS can also be used to help screen for unserviceable masks, assist in determining if Preventive Maintenance Checks and Services (PMCS) have been conducted properly on critical components and can assist in training personnel on the proper wearing of the mask.

CHARACTERISTICS/DESCRIPTION

- Small, lightweight, portable
- Weight: 4 lbs.
- Size: 200 cu. in.

CAPABILITY/IMPROVEMENTS

- Computes fit factor of mask using particles in ambient air
- Assures no critical leaks in protective mask on soldier
- Supports chemical surety site operations, USMC & USAF

SPECIAL FEATURES

- Verifies fit and combat readiness of protective masks
- Easy to operate
- Set-up time: less than five minutes
- Miniature condensation nuclei counter

CONTRACTORS

- TSI Incorporated, St. Paul, MN

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE											
PROC	18.1	5.3									23.4
TOTAL	18.1	5.3									23.4
QTY	3159	908									4067

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE											
PROC	18.1	7.3									25.4
TOTAL	18.1	7.3									25.4
QTY	3159	1268									4427
PGM Chg		2.0									2.0

Notes
Prior updated to actuals.

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 5011
Joint Acq Objective: 6864
QTY Through FY07: 4427

O&O/ORD

Unit	ORG	QTY
	USA	3334
	USAF	1208
	USMC	474

Fielding

- Surety sites - DEC 93
- Force Package 1 - Nov 94
- Ongoing to FP2/3

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	5.727
Program Acq Cost	5.727
Quantity	4427

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	0.0
Procurement	25.4
Total Program	25.4

Current Status

- **DOD POSITION**
  - The PATS ensures that protective masks are combat ready (properly sized, fitted, and functional).
- **FIELDING**
  - As of December 1998, 2,500 systems had been fielded, and fielding is continuing.
- **QUANTITY** - N/A
- **PROCUREMENT**
  - A total of 6,864 systems will be procured. 6,185 for Army, 469 for USMC and 640 for Air Force.
  - Quantities in Program Funding will update to: FY99 - 900, FY00 - 904 to reflect actuals.
- **FMS**
  - None
- **MODIFICATIONS**
  - None
- **ISSUES**
  - None

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PATS - PROTECTION ASSESSMENT TEST SYSTEM (M41)

UNCLASSIFIED

Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE							
Proc							
Total							

HASC: Mr. Jean Reed
- No Language

SASC: Mr. Joe Sixeas
- No Language

Conf
- No Language

HAC-D: Mr. David Norquist
- No Language

SAC-D: Mr. John Young
- No Language

Conf
- No Language

Notes

PATS enhances operational capability by providing a simple, rapid, and accurate means of validating the face piece fit and function of protective masks.

Schedule

FY	98	99	00	01	02	03	04	05	06	07	08	09
Production/Deliveries												

PROT CLTH - PROTECTIVE CLOTHING (JSLIST/FFE/EOD)

UNCLASSIFIED

System Description

MISSION

- The goal of the Protective Clothing program is to provide state-of-the-art CB protective suits, boots, and gloves which can be worn in conjunction with existing individual combat clothing equipment. This program provides
- equipment that reduces the burden placed on ground and aviation personnel during wartime without compromising CB protection.

CHARACTERISTICS/DESCRIPTION

- Protective Suits - Overgarments (OG)
- Protective Boots (MULO)
- Protective Gloves (In development)

CAPABILITY/IMPROVEMENTS

- Improved chemical protection (to 45 days)
- Reduced heat stress
- Split issue - improved fit
- Full compatibility with all interfacing equipment

SPECIAL FEATURES

- Launderable
- Longer wear (45 Days)
- Single technical data package
- Standard tariff

CONTRACTORS

- Creative Apparel, Belfast, ME.
- NISH, ME, TX, KY and MI.
- Tingley Rubber Inc., South Plainsfield, NJ.

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	26.5	2.8									29.3
PROC	197.0	95.1	96.5	89.5	86.8	87.3	88.0				740.2
TOTAL	223.5	97.8	96.5	89.5	86.8	87.3	88.0				769.5
QTY	829065	359166	330871	351340	341323	335800	338607				2886172

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	26.5	3.0	3.5	1.5	3.8						38.4
PROC	198.4	87.2	100.6	99.2	87.4	78.5	88.7	90.6			830.7
TOTAL	224.9	90.2	104.1	100.7	91.3	78.5	88.7	90.6			869.1
QTY	491626		371851	361024	357182	278026	314509	320937			2495155
PGM Chg	1.4	(7.6)	7.6	11.2	4.4	(8.8)	0.7	90.6			99.6

Notes
FY00 congressional increase. FY01 PDM I plus up for 23,000 interim JPACE suits. FY04/05 POM zero sum move from In-Line Water Chem/Bio water monitor.
Transitions to Joint Chemical Ensembles in FY06 . Quantities are protective overgarments only.

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 4728784
Joint Acq Objective: 4872333
QTY Through FY07: 2495155

O&O/ORD

Unit	ORG	QTY
	USA	2346809
	USAF	1224369
	USN	470000
	USMC	831155

Fielding

- Ongoing to all Services.

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	0.332
Program Acq Cost	0.348
Quantity	2495155

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	38.4
Procurement	830.7
Total Program	869.1

Current Status

- **DOD POSITION**
  - JSLIST consolidates the Army, Navy, Air Force, and Marine Corps individual chemical/biological protection requirements and provides significant improvements over the current ensembles
- **FIELDING**
  - IOC 1997
  - Army to War Reserves.
  - Navy ongoing.
  - Air Force limited.
- **QUANTITY** - N/A
- **PROCUREMENT**
  - A total of approximately 2,612,172 systems will be procured as initial replacement for current chemical protective clothing.
  - Navy is procuring OG and boot only.
  - Army, Air Force, and Marines are procuring OG, boots and gloves
  - Individual Issue Item (Between 2 and 6 ensembles per individual including war reserves)
- **FMS** - N/A
- **MODIFICATIONS** - N/A
- **ISSUES** - N/A

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PROT CLTH - PROTECTIVE CLOTHING (JSLIST/FFE/EOD)

UNCLASSIFIED

Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE							
Proc							
Total							

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

SASC: Mr. Joe Sixeas
- No Language

SAC-D: Mr. John Young
- No Language

Conf
- No Language

Conf
- No Language

Notes

The JSLIST program will provide a family of enhanced CB protective ensembles with reduced physiological heat burden that will be generally lightweight and launderable. The garments will also integrate other types of protection.

Schedule

FY	98	99	00	01	02	03	04	05	06	07	08	09
JSLIST Block I Glove Operational Test (OT)				-								
JSLIST Block I Glove Milestone IIIA				-								
JSLIST Block II Glove Prototype Build					-							
JSLIST Block II Glove Milestone IIIA						-						

CBPS - CB PROTECTIVE SHELTER/P3I

UNCLASSIFIED

System Description

MISSION

- Provides a highly mobile, environmentally controlled, contamination free work area for Forward Surgical Teams and forward deployed Echelon I and II medical treatment facilities in order to provide emergency medical treatment in a CB environment.

CHARACTERISTICS/DESCRIPTION

- Replacement for the M51
- Consists of Heavy HMMWV, a Lightweight Multipurpose Shelter, 300 square foot airbeam-supported shelter and High-Mobility Trailer with a 10kW Tactical Quiet Generator

CAPABILITY/IMPROVEMENTS

- Highly mobile
- Set-up within 20 minutes in conventional environment
- Set-up within 40 minutes in CB environment
- Improved maintainability

SPECIAL FEATURES

- Hydraulically powered HMMWV engine
- Soft shelter -- a teflon/kevlar-laminate fabric which is decontaminable
- Chem-Bio filters

CONTRACTORS

- Engineered Air Systems, Inc., St. Louis, MO

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	5.0										5.0
PROC	51.8	13.9	11.5	16.4	16.4	20.5	20.6	23.6	23.7	Cont.	Cont.
TOTAL	56.8	13.9	11.5	16.4	16.4	20.5	20.6	23.6	23.7	Cont.	Cont.
QTY	120	30	26	38	37	45	44	50	50	Cont.	Cont.

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	5.0			0.8	1.4	1.1	1.6				10.0
PROC	51.8	4.1	11.4	15.7	15.0	15.6	14.3	23.9	23.9	Cont.	Cont.
TOTAL	56.8	4.1	11.4	16.5	16.4	16.8	15.9	23.9	23.9	Cont.	Cont.
QTY	120		22	32	31	31	28	48	47	Cont.	Cont.
PGM Chg		(9.8)	(0.1)	0.1		(3.7)	(4.6)	0.2	0.3		

Notes
FY98 - Reprogramming of RDTE to fund follow-on operational test.
FY01 - POM reprogrammed to CPDEPMEDS to fund increased quantity requirement.

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 792
Joint Acq Objective: 792
QTY Through FY07: 359

O&O/ORD

Unit	ORG	QTY
	USA	792

Fielding

- FUE: Limited Release 8/00
- FUE: Full Release 6/01

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	486.576
Program Acq Cost	522.544
Quantity	312

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	10.0
Procurement	175.7
Total Program	185.7

Current Status

- **DOD POSITION**
  - Type Classification-Limited Procurement (LP) approved 15 Dec 94 to support urgent Army Surgeon General requirement.
- **FIELDING**
  - None fielded to date.
  - FUE limited release scheduled for FY00.
  - FUE full release scheduled for Jun 01.
- **QUANTITY** - N/A
- **PROCUREMENT**
  - LP quantity of 152 awarded through FY00.
  - MS III Mar 01.
  - FY01 option scheduled for Apr 01.
- **FMS**
  - None
- **MODIFICATIONS**
  - None
- **ISSUES**
  - Revised ORD was approved Jan 00

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CBPS - CB PROTECTIVE SHELTER/P3I

UNCLASSIFIED

Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE							
Proc							
Total							

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

SASC: Mr. Joe Sixeas
- No Language

SAC-D: Mr. John Young
- No Language

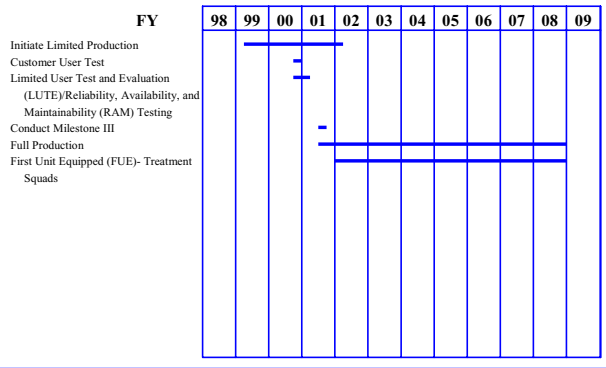
Conf
- No Language

Conf
- No Language

Notes

The CBPS provides collective protection (300 sq. ft.) for medical and selected combat, combat support, and combat service support personnel to perform missions in a CB environment. It is highly mobile and easy to set up and take down.

Schedule



EXECUTIVE SUMMARY PRODUCED BY JSCBIS

UNCLASSIFIED

CPDEPMEDS - COLLECTIVELY PROTECTED DEPLOYABLE MEDICAL SYSTEM

UNCLASSIFIED

System Description

MISSION

- Provide environmentally controlled collective protection to the Hospital Unit Base (HUB) of fielded DEPMEDS Combat Support Hospitals in order to sustain medical operations in a CB environment.

CHARACTERISTICS/DESCRIPTION

- System consists of the M28 Collective Protection Equipment, CB Hardened ISO Shelter Seals, CB Protected Water Distribution System, CB Protected Latrines, Low Pressure Alarms and CB Protected Environmental Control Units and Heaters

CAPABILITY/IMPROVEMENTS

- Ability to sustain medical operations in a CB environment for up to 72 hours
- Once employed, can be activated in less than one hour

SPECIAL FEATURES

- Provides a capability not currently available to medical personnel. Fully integrated system for use with DEPMEDS hospitals
- Provides environmental control for use from -15 deg F to 110 deg F
- CB conversion kits for ECUs

CONTRACTORS

- ILC Dover, Inc., Frederica, DE
- Intellitec, Deland, FL (M28 CPE)
- KECO Industries, Florence, KY (FDECU)
- Engineered Air Systems, Inc., St. Louis, MO (CB conversion kits for ECUs)

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE											
PROC		2.7	6.0	2.0							10.7
TOTAL		2.7	6.0	2.0							10.7
QTY		3	8	3							14

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE											
PROC		2.7	5.9	3.0							11.7
TOTAL		2.7	5.9	3.0							11.7
QTY		3	8	3							14
PGM Chg			(0.1)	1.0							1.0

Notes
FY01 - POM reprogrammed from CBPS to fund increased quantity requirement.

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 23
Joint Acq Objective: 23
QTY Through FY07: 14

O&O/ORD

Unit	ORG	QTY
	USA	23

Fielding

- FUE: 3/01
- FP: FP1

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	832.642
Program Acq Cost	832.642
Quantity	14

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	0.0
Procurement	11.7
Total Program	11.7

Current Status

- **DOD POSITION** - N/A
- **FIELDING**
  - FUE scheduled for Mar 01.
- **QUANTITY** - N/A
- **PROCUREMENT**
  - MS III for CP Systems is Mar 00.
  - CP System Integration components will be procured in FY00-02.
  - First delivery scheduled for Jan 01.
- **FMS**
  - None
- **MODIFICATIONS**
  - None
- **ISSUES**
  - Impact on Force Structure being considered in next POM to determine additional need.
  - Medical personnel have no collective protection in current DEPMEDS hospitals for sustained operations.
  - Will be fielded in MF2K (Medical Force 2000) configuration first, then convert to MRI (Medical Restructing Initiative).

CPDEPMEDS - COLLECTIVELY PROTECTED DEPLOYABLE MEDICAL SYSTEM
UNCLASSIFIED
1 FEB 2001
SAAL-ZCS PAUL LANGE (703) 604-7245
DAMO-FDB COL IZZO (703) 695-3089

Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE							
Proc							
Total							

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

SASC: Mr. Joe Sixeas
- No Language

SAC-D: Mr. John Young
- No Language

Conf
- No Language

Conf
- No Language

Notes

The purpose of the CP DEPMEDS is to provide environmental controlled collective protection to the Hospital Unit Base of fielded DEPMEDS hospitals. It will provide a clean, toxic free environmentally controlled patient treatment area maximizing the use of existing equipment.

Schedule

FY	98	99	00	01	02	03	04	05	06	07	08	09
Initial Operational Test and Evaluation (IOT&E)			-									
Milestone III				-								
CP DEPMEDS Set Assembly				-								
First Unit Equipped (FUE)					-							

System Description

MISSION

- To provide on demand protection against NBC threat agents to selected mission-critical operational spaces and crew sustainability spaces on selected ship classes.

CHARACTERISTICS/DESCRIPTION

- Provides collective protection zones within existing amphibious ships
- Air filters and pressurization of spaces prevents entry of NBC contaminants

CAPABILITY/IMPROVEMENTS

- Eliminates need to wear protective gear (i.e., suits, masks) in protected areas
- Increases ship's ability to perform mission critical/sustaining operations in an NBC contaminated environment

SPECIAL FEATURES

- Installations will be accomplished by "zones"
- Each ship has multiple zones: crew sustainability spaces, medical spaces, and combat information centers
- Target ships are amphibious ships with significant operational life beyond FY05-10 time frame

CONTRACTORS

- Ship Installation Drawings - Various Planning Yards
- Installation of CPS - Ship Repair Facility, Sasebo, Japan; NSWCCD-SSES, Philadelphia, PA; SUPSHIP, San Diego, CA

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE											
PROC	1.0	12.1	17.7	17.7	17.3	19.4	18.9	11.4	7.6		123.1
TOTAL	1.0	12.1	17.7	17.7	17.3	19.4	18.9	11.4	7.6		123.1
QTY											

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE											
PROC	1.0	12.0	17.5	17.8	17.4	19.6	19.1	11.5	7.7		123.6
TOTAL	1.0	12.0	17.5	17.8	17.4	19.6	19.1	11.5	7.7		123.6
QTY		5	6	6	9	7	8	6	4		51
PGM Chg		(0.1)	(0.2)	0.1	0.1	0.2	0.2	0.1	0.1		0.5

Notes
Unit cost of CPS Backfit per zone varies based on type and availability of ships to be backfit. System Cost Data is an average of of the cost per zone.

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 15
Joint Acq Objective: 15
QTY Through FY07: 51

O&O/ORD

Unit	ORG	QTY
LHD 1 Cl	USN	7
LSD 41 Cl	USN	3
LHA 1 Cl	USN	5

Fielding

- See Schedule

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	2466.787
Program Acq Cost	2466.787
Quantity	47

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	0.0
Procurement	123.6
Total Program	123.6

Current Status

- **DOD POSITION**
  - Supports force modernization and Joint NBC Defense concept of protection. Addresses the Quadrennial Defense Review's requirement for additional NBC protection of Amphibious ships determined to be at risk.
- **FIELDING**
  - Four protective zones on LHD-2 (USS ESSEX) scheduled to be completed 4th quarter FY01
- **QUANTITY**
  - The CIC zone on LHA-5 (USS PELELIU), and four zones on LHD-1 (USS WASP), were completed 4th quarter FY00.
- **PROCUREMENT**
  - Planned procurement of Government Furnished Equipment scheduled to begin 1st quarter FY00.
- **FMS**
  - None
- **MODIFICATIONS**
  - None
- **ISSUES**
  - None

CPSBKFT - CPS BACKFIT

UNCLASSIFIED

1 FEB 2001
SAAL-ZCS PAUL LANGE (703) 604-7245
DAMO-FDB COL IZZO (703) 695-3089

Congressional / OSD Issues

- None

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE							
Proc							
Total							

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

SASC: Mr. Joe Sixeas
- No Language

SAC-D: Mr. John Young
- No Language

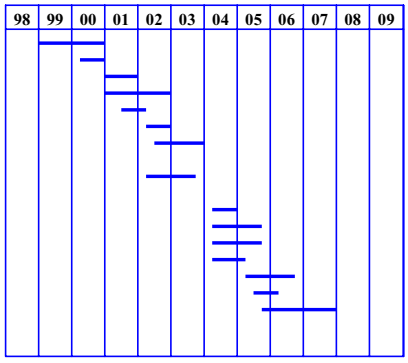
Conf
- No Language

Conf
- No Language

Notes

Each ship will have multiple protective zones installed as follows:
LHD1-6: Combat information center (CIC) zone, and three medical zones
LHA 1&5: CIC zone, two medical zones, and one berthing zone
LHA 2-4: two medical zones and one berthing zone (CIC zone already protected)
LSD 41-43: CIC zone and one crew sustainability zone

Schedule



JTCOPS - JOINT TRANSPORTABLE COLLECTIVE PROTECTION SHELTER

UNCLASSIFIED

1 FEB 2001
SAAL-ZCS PAUL LANGE (703) 604-7245
DAMO-FDB COL IZZO (703) 695-3089

System Description

MISSION

- To provide relief from physiological and psychological stresses due to wearing Individual Protection Equipment during sustained operations in an Nuclear/Biological/Chemical contaminated environment. It will be used for command & control, billeting, medical and rest & relief.

CHARACTERISTICS/DESCRIPTION

- Lightweight, modular shelter system to provide protection from Nuclear/Biological/Chemical (NBC) Warfare Agents
- Includes its own dedicated power, environmental control and NBC filtration systems
- Can be used as a stand-alone system or within existing structures

CAPABILITY/IMPROVEMENTS

- Will provide increased duration of operation in an NBC-contaminated environment
- Will provide flexibility to expand by adding additional modules
- Will provide standard, NBC-hardened facilities for billeting, command & control, medical and rest & relief functions.

SPECIAL FEATURES

- Modular design will allow connection to other NBC-protected shelters and vehicles
- Will provide protection against Toxic Industrial Materials
- Capable of operating for 30 days in an NBC-contaminated environment w/o filter replacement

CONTRACTORS

- To Be Selected

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE		2.6	4.5	4.6	4.6	2.2	2.8				21.2
PROC						2.0	2.0				4.0
TOTAL		2.6	4.5	4.6	4.6	4.2	4.8				25.3
QTY											

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE		1.8	1.5	4.6	4.4	4.0	2.5				18.7
PROC							2.0	2.0	2.0	Cont.	Cont.
TOTAL		1.8	1.5	4.6	4.4	4.0	4.6	2.0	2.0	Cont.	Cont.
QTY							27	27	27	Cont.	Cont.
PGM Chg		(0.8)	(3.1)		(0.2)	(0.2)	(0.2)	2.0	2.0		

Notes

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 0
Joint Acq Objective: 0
QTY Through FY07: 81

O&O/ORD

Unit	ORG	QTY
All	USA	7048
All	USAF	6300
All	USMC	4449
All	USN	2952

Fielding

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	75.333
Program Acq Cost	422.333
Quantity	54

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	18.7
Procurement	6.1
Total Program	24.8

Current Status

- **DOD POSITION**
  - JTCOPS was priority #14 out of 44 on the Joint NBC Defense Board priority list for FY99.
- **FIELDING**
  - Not Applicable
- **QUANTITY**
  - None
- **PROCUREMENT**
  - Development program begins in FY00.
- **FMS**
  - TBD
- **MODIFICATIONS**
  - N/A
- **ISSUES**
  - None

JTCOPS - JOINT TRANSPORTABLE COLLECTIVE PROTECTION SHELTER

UNCLASSIFIED

1 FEB 2001
SAAL-ZCS PAUL LANGE (703) 604-7245
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Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE							
Proc							
Total							

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

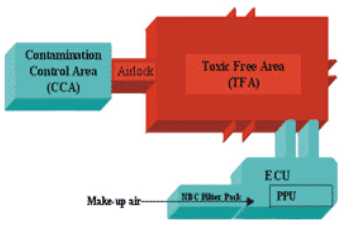
SASC: Mr. Joe Sixeas
- No Language

SAC-D: Mr. John Young
- No Language

Conf
- No Language

Conf
- No Language

Notes



Notional JTCOPS Module (500 lbs. per module (packaged))

Schedule

FY	98	99	00	01	02	03	04	05	06	07	08	09
Milestone I - Block I				-								
Design and Fabricate Prototypes for Development Test (DT) - Block I					—	—						
DT - Block I						-	-					
Milestone II - Block I							-					
Low Rate Initial Production (LRIP)							—	—				
Operational Test (OT) - Block I								-	-			
Milestone III - Block I									-			

M28CPS - TRANSPORTABLE COLLECTIVE PROTECTION SYSTEM

UNCLASSIFIED

1 FEB 2001
SAAL-ZCS PAUL LANGE (703) 604-7245
DAMO-FDB COL IZZO (703) 695-3089

System Description

MISSION

- To provide interim collective protection to key operations and medical personnel in a chemically/biologically contaminated environment.

CHARACTERISTICS/DESCRIPTION

- Kits for stand-alone or warehouse applications
- Kit components include filtration systems, air distribution systems, heating, ventilation & A/C, M28 liners and modular tent systems

CAPABILITY/IMPROVEMENTS

- Highly efficient filtration capability
- Deployable, configurable systems designed to interface with existing base infrastructure

SPECIAL FEATURES

- M28 temper liners
- Chemically/Biologically hardened air management plant
- Uses GOTS and COTS components

CONTRACTORS

- Engineered Air System, Inc., St. Louis, MO
- Management Consulting, Inc., San Antonio, TX

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE											
PROC	8.6	6.5									15.1
TOTAL	8.6	6.5									15.1
QTY											

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE											
PROC	8.6	4.2	3.6								16.4
TOTAL	8.6	4.2	3.6								16.4
QTY											
PGM Chg		(2.3)	3.6								1.3

Notes

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 0
Joint Acq Objective: 0
QTY Through FY07: 0

O&O/ORD

Unit	ORG	QTY
PACAF	USAF	41
AFSOC	USAF	6
AMC	USAF	13
AETC	USAF	2
NAVCENT	USN	3
ACC	USAF	7

Fielding

- PACAF
- AFSOC
- AMC
- AETC
- NAVCENT
- ACC

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	None
Program Acq Cost	None
Quantity	None

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	0.0
Procurement	16.4
Total Program	16.4

Current Status

- **DOD POSITION** - N/A
- **FIELDING**
  - FY 00 - 11 (96ft) operational stand-alone kits and 2 warehouse configuration kits to be delivered in FY 01 to PACAF locations in Korea. 2 training kits, 6 (96ft) operational stand-alone kits, and 3 (96 + 128 ft) stand-alone operational stand-alone kits to be delivered to AMC. 1 training kit and 5 (96ft) opertional stand-alone kits to be delivered to AFSOC. 1 training kit each to AETC (AF Silver Flag and Ft Leonard Wood Chemical School).
- **QUANTITY**
  - 30 Kits have been fielded to date.
- **PROCUREMENT**
  - Kits: FY98 - 18, FY99 - 12, FY00 - 32, FY01 - 10.
- **FMS** - N/A
- **MODIFICATIONS** - N/A
- **ISSUES** - N/A

EXECUTIVE SUMMARY PRODUCED BY JSCBIS

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M28CPS - TRANSPORTABLE COLLECTIVE PROTECTION SYSTEM

UNCLASSIFIED

1 FEB 2001
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Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE							
Proc							
Total							

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

SASC: Mr. Joe Sixeas
- No Language

SAC-D: Mr. John Young
- No Language

Conf
- No Language

Conf
- No Language

Notes

The M28 is a liner system that is designed to provide CB protection for the Army Deployable Medical System.

Schedule

FY	98	99	00	01	02	03	04	05	06	07	08	09
Kit Production				—								

EXECUTIVE SUMMARY PRODUCED BY JSCBIS

UNCLASSIFIED

SCPE - SHIPBOARD COLL PROTECTION EQUIP

UNCLASSIFIED

System Description

MISSION

- Provide advanced and improved shipboard collective protection equipment.

CHARACTERISTICS/DESCRIPTION

- Systems use filtered supply air to pressurize ship zones allowing contamination-free spaces for mission critical operations during a chemical/biological (CB) threat or contaminated environment
- Continues evolution of Chemical Biological Radiological-Defense (CBR-D) filtration capability and efficiency
- Designed to address 21st Century ship platforms

CAPABILITY/IMPROVEMENTS

- New long-life HEPA filter
- New long-life prefilter system
- Energy-efficient, quiet-supply fans
- Lower logistic costs by approximately 50%

SPECIAL FEATURES

- Reduced operating costs
- Increased system performance
- Provide environment where personnel can perform mission objectives free of individual Chemical/Biological (CB) protective clothing
- Protect against new and novel agents

CONTRACTORS

- New World Associates, Inc. Fredericksburg, VA

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	2.9	0.7	0.7	0.7	0.7						5.7
PROC											
TOTAL QTY	2.9	0.7	0.7	0.7	0.7						5.7

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	2.9	0.7	0.7	0.7	0.7						5.7
PROC											
TOTAL QTY	2.9	0.7	0.7	0.7	0.7						5.7

PGM Chg (0.1)

Notes

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 0
Joint Acq Objective: 0
QTY Through FY07: 0

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	None
Program Acq Cost	None
Quantity	None

O&O/ORD

Unit	ORG	QTY
Amphibious		
Auxiliary		
Mine		
Combatant		

Fielding

- Product improvements will be incorporated into all existing Collective Protection System (CPS) ships as well as new construction platforms.

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	5.7
Procurement	0.0
Total Program	5.7

Current Status

- **DOD POSITION**
  - Advancements in SCPE capability are critical to CBR-D Performance Objectives and affordability of 21st Century shipbuilding.
- **FIELDING**
  - Product improvements will be incorporated into all existing Collective Protection System (CPS) ships as well as new construction platforms.
- **QUANTITY**
  - N/A
- **PROCUREMENT**
  - FY02 - Continue shipboard testing of improved CPS fan. Shipboard testing is required to verify actual noise reduction in a fan room and adjacent manned spaces on board a ship. Use test data to revise performance specification as necessary. Improved CPS fans will increase efficiency and reduce noise levels by 12 to 17 decibels. Complete third year of verification testing to validate the four-year performance of improved prefilters and HEPA filters. Continue evaluation of potential HEPA filter performance degradation after toxic industrial chemical/material (TIC/TIM) exposure. Continue development and testing of two electronic differential pressure gauges for remote reading to ease shipboard maintenance. Prepare and update documentation (test reports, technical manuals, and TDPs). Initiate transition of selected efforts to JCPE.
  - FY03 - Complete shipboard testing of improved CPS fans. Test data will be used to revise performance specification as necessary. Complete final year of verification testing to validate the four-year performance of improved prefilters and HEPA filters. Complete evaluation of potential HEPA filter performance degradation after TIC/TIM exposure. Complete development and testing of two electronic differential pressure gauges for remote reading to ease shipboard maintenance. Complete documentation (test reports, technical manuals, and TDPs). Complete transition of selected efforts to JCPE.
- **FMS**
  - N/A
- **MODIFICATIONS**
  - N/A
- **ISSUES**
  - N/A

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SCPE - SHIPBOARD COLL PROTECTION EQUIP

UNCLASSIFIED

Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE							
Proc							
Total							

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

SASC: Mr. Joe Sixeas
- No Language

SAC-D: Mr. John Young
- No Language

Conf
- No Language

Conf
- No Language

Notes

Schedule

FY	98	99	00	01	02	03	04	05	06	07	08	09

JSFXD - JS FIXED SITE DECON (JSFXD)

UNCLASSIFIED

System Description

MISSION

- Development and acquisition of a family of decontaminates and delivery systems that provide a capability to restore operations.

CHARACTERISTICS/DESCRIPTION

- Remove, detoxify, neutralize, and eliminate nuclear, biological, chemical, and toxic Industrial Chemical Hazards on personnel, equipment, facilities, and battlespace areas
- 3 Blocks: I - a system of decontaminates; II - a system for decontamination applicators; III - a system of medical decontaminates

CAPABILITY/IMPROVEMENTS

- Decontamination of fixed sites, ports of entry, airfields, logistics support forces, and key command and control centers

SPECIAL FEATURES

- Reduce NBC hazards to a safe or minimal level suitable for any surface
- No adverse effects on electronics
- Nontoxic and noncorrosive
- Minimize: water contamination, health hazards, collateral damage, logistical support, and stockpiling maintenance

CONTRACTORS

- Battelle Memorial Institute, Columbus, OH

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	8.4	5.2	6.5	3.5	3.0			4.0	4.0	Cont.	Cont.
PROC				1.5	2.0	7.5	6.6			Cont.	Cont.
TOTAL	8.4	5.2	6.5	5.0	5.0	7.5	6.6	4.0	4.0	Cont.	Cont.
QTY										Cont.	Cont.

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	8.4	2.5	4.4	5.5	4.3	1.0	0.9	4.0	4.0	Cont.	Cont.
PROC				1.5	2.0	7.6	6.7			Cont.	Cont.
TOTAL	8.4	2.5	4.4	7.1	6.3	8.5	7.6	4.0	4.0	Cont.	Cont.
QTY				54424	116545					Cont.	Cont.
PGM Chg		(2.7)	(2.1)	2.1	1.3	1.0	1.0				

Notes
FY01 POM zero sum move. FY02/03 program procures decontaminates (Block I). FY04/05 program procures decontaminates (Block I) and applicators (Block II). The wide variance in unit cost prohibit display of a true quantity for this program. FY02-05 quantities error in FY00 PB corrected in FY01 PB.

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 0
Joint Acq Objective: 0
QTY Through FY07: 170969

O&O/ORD

Unit	ORG	QTY
All		
All		

Fielding

- TBD

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	0.103
Program Acq Cost	0.285
Quantity	170969

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	35.1
Procurement	17.8
Total Program	52.9

Current Status

- **DOD POSITION**
  - Provides restoration capability at fixed-site locations.
- **FIELDING**
  - Block I fielding is scheduled to begin in 4Q FY02.
- **QUANTITY** - N/A
- **PROCUREMENT**
  - FY02-05 funds a family of decontamination components.
  - Block I procurement is scheduled to begin in 1Q FY02.
  - Block II procurement is scheduled to begin FY04.
- **FMS**
  - None
- **MODIFICATIONS**
  - None
- **ISSUES**
  - None

EXECUTIVE SUMMARY PRODUCED BY JSCBIS

UNCLASSIFIED

1 FEB 2001
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JSFXD - JS FIXED SITE DECON (JSFXD)

UNCLASSIFIED

Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE							
Proc							
Total							

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

SASC: Mr. Joe Sixeas
- No Language

SAC-D: Mr. John Young
- No Language

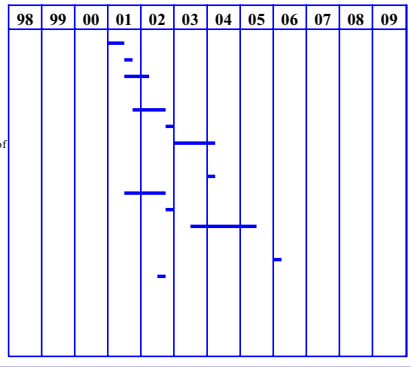
Conf
- No Language

Conf
- No Language

Notes

JSFXD will provide decontamination capabilities for airfields, ports, and logistics centers.

Schedule



EXECUTIVE SUMMARY PRODUCED BY JSCBIS

UNCLASSIFIED

JSSED - JS SENSITIVE EQUIP DECON

UNCLASSIFIED

System Description

MISSION

- Block I systems will decontaminate (and possibly provide precision cleaning for) sensitve equipment, electronics, and items that cannot survive exposure to other decontamination methods.
- Block II systems will decontaminate aircraft/vehicle/ship interiors without damaging internal systems or affecting service life of those systems.
- Block III systems will decontaminate aircraft/vehicle/ship interiors during in-flight/ground/shipboard operations without adversely affecting platform performance.

CHARACTERISTICS/DESCRIPTION

- Two-phase program development:
  - Sensitive equipment
  - Vehicle/aircraft interiors

CAPABILITY/IMPROVEMENTS

- New capability to decontaminate high dollar-value and/or sensitive equipment and vehicle/aircraft interiors

SPECIAL FEATURES

- TBD

CONTRACTORS

- TBD

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE			2.6	3.1	4.3	9.9	13.8	3.0	3.0	Cont.	Cont.
PROC						3.1	4.8	6.1	12.3	Cont.	Cont.
TOTAL			2.6	3.1	4.3	13.0	18.6	9.1	15.3	Cont.	Cont.
QTY						156	243	304	613	Cont.	Cont.

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE			1.1	3.2	7.0	12.5	14.3	3.0	3.0	Cont.	Cont.
PROC								6.2	12.4	Cont.	Cont.
TOTAL			1.1	3.2	7.0	12.5	14.3	9.2	15.4	Cont.	Cont.
QTY								304	613	Cont.	Cont.
PGM Chg			(1.6)		2.7	(0.6)	(4.3)	0.1	0.2		

Notes

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 2100
Joint Acq Objective: 2100
QTY Through FY07: 917

O&O/ORD

Unit	ORG	QTY

Fielding

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	20.233
Program Acq Cost	155.246
Quantity	304

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	44.1
Procurement	18.6
Total Program	62.6

Current Status

- **DOD POSITION**
  - TBD
- **FIELDING**
  - TBD
- **QUANTITY** - N/A
- **PROCUREMENT**
  - Procurement for Block I scheduled to begin FY04, Block II TBD
- **FMS**
  - TBD
- **MODIFICATIONS**
  - TBD
- **ISSUES**
  - None

JSSED - JS SENSITIVE EQUIP DECON

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Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE							
Proc							
Total							

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

SASC: Mr. Joe Sixeas
- No Language

SAC-D: Mr. John Young
- No Language

Conf
- No Language

Conf
- No Language

Notes

Schedule

FY	98	99	00	01	02	03	04	05	06	07	08	09

MDS - MODULAR DECONTAMINATION SYSTEM (MDS)

UNCLASSIFIED

System Description

MISSION

- Minimize the impact of enemy use of NBC weapons through the rapid and effective decontamination of equipment.

CHARACTERISTICS/DESCRIPTION

- One stand-alone module for dispensing standard Army decontaminant (DS2) and liquid field expedients
- Two stand-alone modules for removal of gross contamination and rinsing of the applied decontaminant
- Employed by divisional and non-divisional chemical companies

CAPABILITY/IMPROVEMENTS

- Semi-automates the application of decontaminate
- High-pressure wash, more effective and reduced water usage
- Less labor-intensive and improved logistical supportability
- Improved transportability, 3/4-ton trailer vice 5-ton truck

SPECIAL FEATURES

- Electric start and NATO slave cable compatibility
- Hydrant adapters for German and US/Korean urban water sources
- Showering bar providing heated water for personnel showers
- Single fuel forward capability

CONTRACTORS

- The Centech Grp Inc., Alexandria, VA

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	10.7										10.7
PROC	6.0	7.6	9.4	9.8	9.5	0.1					42.3
TOTAL	16.7	7.6	9.4	9.8	9.5	0.1					53.0
QTY	64	74	130	135	134						537

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	10.7										10.7
PROC	6.0	7.5	2.4	5.0	5.0	5.1	5.0	5.1			41.2
TOTAL	16.7	7.5	2.4	5.0	5.0	5.1	5.0	5.1			51.9
QTY	64	71		27	32	41	42	49			326
PGM Chg			(7.0)	(4.7)	(4.5)	5.0	5.0	5.1			(1.1)

Notes
FY02 and later - quantity decreased due to increased cost of procurement of trailers.

Issue under review.

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 478
Joint Acq Objective: 722
QTY Through FY07: 326

O&O/ORD

Unit	ORG	QTY
Chem Co De per squa	USA	1
Chem Co He per squad	USA	1
Naval Faci Decon Uni		

Fielding

- 1 MDS = 1 M21, 2 M22, 3 trailers
- BOI is based on 1 MDS per decon platoon which replaces the 2 M12A1 PDDA or 2 M17LDS which are currently in each platoon
- 3 M1101 High Mobility Trailers will be ASIOE fielded with each MDS.

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	126.361
Program Acq Cost	159.196
Quantity	326

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	10.7
Procurement	41.2
Total Program	51.9

Current Status

- **DOD POSITION**
  - MDS provides less labor intensive decontamination while improving deployment capability with smaller, lighter, and more mobile equipment.
- **FIELDING**
  - Fielding is scheduled to begin in 2QFY02.
- **QUANTITY**
  - 135 MDS purchased through FY2000.
- **PROCUREMENT** - N/A
- **FMS**
  - None
- **MODIFICATIONS**
  - None
- **ISSUES**
  - None

MDS - MODULAR DECONTAMINATION SYSTEM (MDS)
UNCLASSIFIED
1 FEB 2001
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Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE							
Proc							
Total							

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

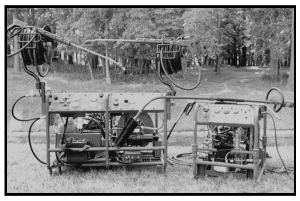
SASC: Mr. Joe Sixeas
- No Language

SAC-D: Mr. John Young
- No Language

Conf
- No Language

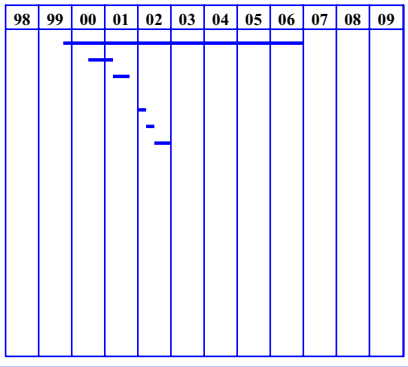
Conf
- . No Language

Notes



The MDS will provide the soldier an improved capability to perform detailed equipment decontamination on the battle field. It consists of a M21 decontaminant Pumper/Scrubber module and a M22 High Pressure/Hot Water module to deliver DS2 or liquid field expedient decontaminants up to 3000 psi at a rate of 5 gpm.

Schedule



SORBDECON - SORBENT DECONTAMINATION

UNCLASSIFIED

System Description

MISSION

- Minimize the impact of enemy use of NBC weapons through the rapid and effective decontamination of equipment.

CHARACTERISTICS/DESCRIPTION

- Provide effective removal of surface contamination while eliminating water vapor and contact hazards associated with the adsorbent after decontamination
- Eliminates DS2 from Immediate (Basic Soldier Skills) decontamination
- Used in personal wipedown and operators spraydown levels of immediate decontamination

CAPABILITY/IMPROVEMENTS

- Reduction in off-gassing and contact hazard associated with the adsorbent after use when compared to the M295 kit
- The adsorbent will be environmentally acceptable, noncorrosive, and stable over a wide temperature range and can be carried and used safely by the service member
- Replaces M11/M13 decontamination apparatuses, associated solutions and configurations

SPECIAL FEATURES

- The Sorbent will be more compatible with Mission Oriented Protective Posture (MOPP) and military equipment than the currently-used DS2

CONTRACTORS

- TBS

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	13.4	4.3	1.5	3.8	8.1	4.7	1.0				36.9
PROC		1.5	2.8	4.8	4.8						13.8
TOTAL	13.4	5.8	4.3	8.6	12.9	4.7	1.0				50.7
QTY		17000	40000	80000	80000						217000

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	13.4	3.0	0.5								16.8
PROC			2.7	8.6	13.0	4.8	1.0				30.2
TOTAL	13.4	3.0	3.2	8.6	13.0	4.8	1.0				47.0
QTY			40000	120000	196853	70000	12500				439353
PGM Chg		(2.8)	(1.1)	0.1	0.1						(3.7)

Notes
FY01 zero sum move to Sensitive Equipment Decon per POM meeting 11 Mar 99.
FY05 POM zero sum move from JS Mini Decontamination System.

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 1134609
Joint Acq Objective: 1135234
QTY Through FY07: 439353

O&O/ORD

Unit	ORG	QTY

Fielding

- Replace M11 apparatus
- Replace M13 apparatus

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	0.068
Program Acq Cost	0.106
Quantity	439353

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	16.8
Procurement	30.2
Total Program	47.0

Current Status

- **DOD POSITION** - N/A
- **FIELDING** - N/A
- **QUANTITY** - N/A
- **PROCUREMENT**
  - Initiated procurement of M24 SDS (two packets of sorbent powder and two mitt applicators) in FY00.
- **FMS** - N/A
- **MODIFICATIONS** - N/A
- **ISSUES** - N/A

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SORBDECON - SORBENT DECONTAMINATION

UNCLASSIFIED

Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE						5.0	3.0
Proc							
Total						5.0	3.0

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

SASC: Mr. Joe Sixeas
- No Language

SAC-D: Mr. John Young
- Procurement $5 million (M) plus for decontamination

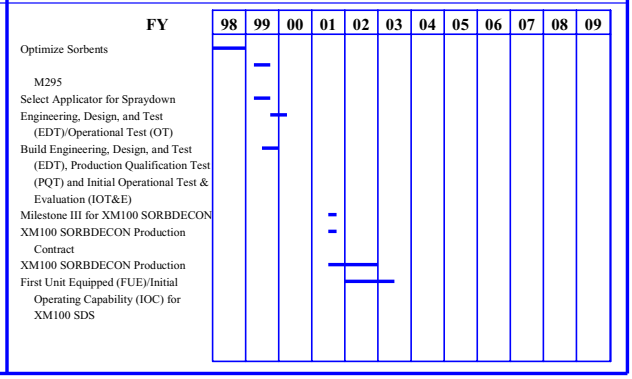
Conf
- No Language

Conf
- Procurement $3M plus for decontamination.
- NOTE: DoD distribution of $3M plus up is $1.5M to Sorbent and $1.5 to MDS.

Notes

The reactive sorbent decontamination system provides a simple, rapid, and efficient system to decontaminate small and individual issue items of equipment. It uses a catalytic component that reacts with the chemical agents being sorbed

Schedule



EXECUTIVE SUMMARY PRODUCED BY JSCBIS

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JBAID - JOINT BIOLOGICAL AGENT IDENT AND DIAG SYSTEM

UNCLASSIFIED

System Description

MISSION

- To provide deployed medical personnel the ability to conduct confirmatory identification and diagnossis of of BW attack utilizing collected clinical specimens and environmental samples

CHARACTERISTICS/DESCRIPTION

- Identifies and quantifies biological organisms of peratonal concern and other pathogens of clinical significance for confirmatory and prognostic purposes.

CAPABILITY/IMPROVEMENTS

- Provides forces with a reuseable, portable,

SPECIAL FEATURES

CONTRACTORS

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE											
PROC											
TOTAL											
QTY											

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE				10.6	10.3						20.9
PROC						5.0					5.0
TOTAL				10.6	10.3	5.0					25.9
QTY											
PGM Chg				10.6	10.3	5.0					25.9

Notes

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 0
Joint Acq Objective: 0
QTY Through FY07: 0

O&O/ORD

Unit	ORG	QTY

Fielding

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	None
Program Acq Cost	None
Quantity	None

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	20.9
Procurement	5.0
Total Program	25.9

Current Status

- **DOD POSITION** - N/A
- **FIELDING** - N/A
- **QUANTITY** - N/A
- **PROCUREMENT** - N/A
- **FMS** - N/A
- **MODIFICATIONS** - N/A
- **ISSUES** - N/A

JBAID - JOINT BIOLOGICAL AGENT IDENT AND DIAG SYSTEM

UNCLASSIFIED

1 FEB 2001
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Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE							
Proc							
Total							

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

SASC: Mr. Joe Sixeas
- No Language

SAC-D: Mr. John Young
- No Language

Conf
- No Language

Conf
- No Language

Notes

Schedule

FY	98	99	00	01	02	03	04	05	06	07	08	09

VACCINES - BIOLOGICAL VACCINES

UNCLASSIFIED

System Description

MISSION

- Develop, test, obtain licensure for, produce and store vaccines for the purpose of protecting U.S. forces against validated biological warfare threat agents.

CHARACTERISTICS/DESCRIPTION

- Develop, produce, and stockpile biological defense vaccines for all Services
- Vaccinated forces will be better protected to perform their mission during a biological warfare attack

CAPABILITY/IMPROVEMENTS

- FDA licensed vaccine available against anthrax
- BD vaccines being developed against validated BW agents

SPECIAL FEATURES

- Ensure availability of FDA licensed anthrax vaccine to protect U. S. Forces

CONTRACTORS

- BioPort LLC (formerly MBPI), Lansing, MI
- Camber, Frederick, MD & Falls Church, VA
- Battelle, Columbus, OH
- Dynport Vaccine Corporation, Frederick, MD
- SAIC, McLean, VA
- Baxter, Deerfield, IL

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	40.8	36.6	53.9	88.9	98.9	67.2	53.1	53.9	55.3	Cont.	Cont.
PROC	40.9	48.6	49.8	40.4	45.6	60.8	64.0	58.3	59.0	Cont.	Cont.
TOTAL	81.6	85.3	103.7	129.3	144.5	128.1	117.1	112.2	114.3	Cont.	Cont.
QTY								27	27	Cont.	Cont.

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	35.7	32.5	49.7	70.4	75.4	67.5	46.6	51.5	52.8	Cont.	Cont.
PROC	46.9	66.4	52.9	56.1	45.9	58.1	63.1	58.8	59.6	Cont.	Cont.
TOTAL	82.5	98.9	102.6	126.5	121.4	125.5	109.7	110.3	112.5	Cont.	Cont.
QTY										Cont.	Cont.
PGM Chg	0.9	13.7	(1.1)	(2.8)	(23.2)	(2.5)	(7.4)	(1.9)	(1.9)		

Notes
PDM I - Adds FY02 - $1.0M; FY03 - $1.6M; FY04 - $1.1M; FY05 - $3.0M RDTE for new vaccine development and FY01 - $12.3M Procurement for additional Anthrax vaccine. FY01 procurement equals 3.4 million doses of anthrax.

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 0
Joint Acq Objective: 0
QTY Through FY07: 0

O&O/ORD

Unit	ORG	QTY
Anthrax	USA	2400000
Hgh Threat	USA	1200000
Others	USA	300000

Fielding

- Joint Acq Objective -BD Vaccines for all services
- Quantities Shown are in Troop Equivalent Doses (TED's)

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	None
Program Acq Cost	None
Quantity	None

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	482.1
Procurement	507.8
Total Program	989.9

Current Status

- **DOD POSITION**
  - Biological Defense Vaccine Program is formally supported by DoD.
- **FIELDING**
  - Anthrax procurement for all Services; other vaccines stockpiled after licensure.
- **QUANTITY**
  - Anthrax Vaccine Adsorb (AVA) Doses - 4,600,790 (1/98 to Present).
- **PROCUREMENT**
  - 2.4M TEDs for anthrax, 1.2M TEDs for vaccines against high BW threats, and 0.3M TEDs for remaining BW threats.
- **FMS**
  - TBD
- **MODIFICATIONS**
  - N/A
- **ISSUES**
  - None

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VACCINES - BIOLOGICAL VACCINES

UNCLASSIFIED

1 FEB 2001
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Congressional / OSD Issues

- SASC: Next Generation Anthrax-The budget request included $400K for a second generation, recombinant vaccine against the biological warfare agent anthrax. The committee recommends an increase of $2.1M for continued research and development of a recombinant vaccine against the biological warfare agent anthrax. The U.S. Army Medical Research Institute of Infectious Diseases developed a second generation, recombinant vaccine against anthrax in 1995. The committee notes that the vaccine currently utilized by the Department of Defense in the Anthrax Vaccine Immunization Program was licensed in 1970 and has been certified as safe and effective by the Food and Drug Administration. The committee is concerned that there is inadequate support for continued research and development of a second generation, recombinant vaccine against the biological agent anthrax and provides additional funding for this effort.
- Appropriation Conference: Next Generation Anthrax-Conferees recommended $1M from within available funds to accelerate the development of a second generation anthrax vaccine at teh U.S. Army Medical Research Institute of Infectious Diseases. The Senate amendment contained a provision that would prohibit the obligation of funds to procure anthrax vaccine until SecDef makes a notification and delivers a report to the congressional defense committees. The House bill contained no similar provisions. The House recedes with an amendment that would establish permissible actions related to the obligation of funds to procure the anthrax vaccine and would require the Secretary to report within seven days to the Congress all obligations in connection with the qualified procurement of anthrax vaccine with a value greater than $5M.

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE							
Proc							
Total							

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- See notes

SASC: Mr. Joe Sixeas
- See Congressional/OSD Issues

SAC-D: Mr. John Young
- No Language

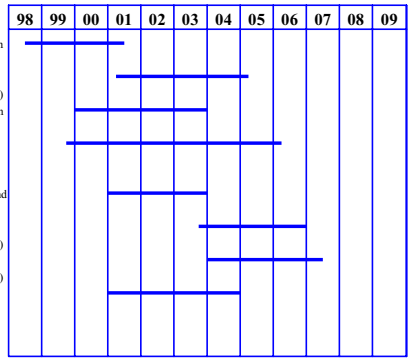
Conf
- No Language

Conf
- See Congressional/OSD Issues

Notes

Anthrax Vaccine Program: The Committee concurs with the findings of the Institute of Medicine interim report on the anthrax vaccine and directs the Secretary of Defense to: immediately submit all relevant research on the safety and efficacy of the anthrax vaccine to peer reviewed scientific journals for publication; make research available to the general public through the AVIP website; and establish a statistically significant active long term monitoring program to document the relative safety of the vaccine. The committee is also concerned by continuing financial difficulties and irregularities identified by the Inspector General and the Defense Contract Audit Agency and direct the Department to expeditiously implement adequate accounting measures.

Schedule



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System Description

MISSION

- To preserve combat effectiveness by timely provision of medical countermeasures in response to Joint Service Chemical Warfare defense requirements.

CHARACTERISTICS/DESCRIPTION

- To provide individual level protection and prevent casualties by the use of medical countermeasures
- To provide diagnostics for chemical threat agents
- To support the development of definitive care strategies for chemical warfare agent casualties

CAPABILITY/IMPROVEMENTS

- Maintain technological capability to meet present chemical defense requirements and counter future threats
- Provide enhanced diagnostic and medical management of chemical warfare agent casualties and enhanced survival

SPECIAL FEATURES

- Early diagnosis
- Rapid delivery of focused health care to casualties
- Develop new concepts for prophylaxes, pretreatments, antidotes, and therapeutic countermeasures for chemical threat agents

CONTRACTORS

- SAIC, McLean, VA
- Battelle, Columbus, OH
- Univ of Cal, San Diego, CA
- Univ of Nebraska, Lincoln, NE
- Univ of Maryland, Baltimore, MD
- UMASS Medical Ctr, Worcester, MA

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	464.7	30.5	34.7	36.5	36.1	36.8	36.8	35.8	36.6	Cont.	Cont.
PROC											
TOTAL	464.7	30.5	34.7	36.5	36.1	36.8	36.8	35.8	36.6	Cont.	Cont.
QTY											

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	452.3	30.0	33.8	39.8	37.4	40.3	40.5	42.7	43.1	Cont.	Cont.
PROC											
TOTAL	452.3	30.0	33.8	39.8	37.4	40.3	40.5	42.7	43.1	Cont.	Cont.
QTY											
PGM Chg	(12.4)	(0.5)	(0.9)	3.4	1.3	3.6	3.7	6.9	6.5		

Notes
Increases in FY02-07 due to FY02 POM increases. Remaining program changes are funding adjustments due to PBD 289, Defense Wide Program and PBD 604, Inflation.

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 0
Joint Acq Objective: 0
QTY Through FY07: 0

O&O/ORD

Unit	ORG	QTY

Fielding

- NA

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	None
Program Acq Cost	None
Quantity	None

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	760.0
Procurement	0.0
Total Program	760.0

Current Status

- **DOD POSITION**
  - The Medical Chemical Defense Research Program is strongly supported by DoD as a Joint program as directed by Public Law 103-160 and is managed in accordance with the DoD Chemical and Biological Defense Management Plan.
- **FIELDING** - N/A
- **QUANTITY** - N/A
- **PROCUREMENT** - N/A
- **FMS** - N/A
- **MODIFICATIONS** - N/A
- **ISSUES** - N/A

TBMDCHEM - TECH BASE MEDICAL CHEMICAL
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Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE							
Proc							
Total							

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

SASC: Mr. Joe Sixeas
- No Language

SAC-D: Mr. John Young
- No Language

Conf
- No Language

Conf
- No Language

Notes

TC1 (Basic Research): Project emphasizes understanding of basic action mechanisms of nerve, blister, blood and respiratory agents. Basic studies performed to identify mechanisms and site(s) of action for identified and emerging chemical threats, to generate required information for initial design and synthesis of medical countermeasures. These studies are designed to maintain and extend science base.
TC2 (Applied Research): Project supports applied research of prophylaxes, pretreatments, antidotes, skin decontaminants, and therapeutic compounds that have the potential to counteract the lethal, physical, and behavioral toxicities of chemical agents. It also supports development of medical chemical defense material for field diagnostics and chemical casualty care and management procedures.
TC3 (Adv Tech Dev): Project supports the concept exploration of investigational medical countermeasures with a high likelihood of becoming an improved pretreatment/treatment/diagnostic to protect U.S. forces against known and emerging CW threat agents. Analytical stability studies, safety, and efficacy screening, as well as preclinical toxicology studies are performed prior to full scale development of promising pretreatment/treatment compounds.

Schedule

FY	98	99	00	01	02	03	04	05	06	07	08	09

TBMDBIO - TECH BASE MEDICAL BIOLOGICAL

UNCLASSIFIED

System Description

MISSION

- To preserve combat effectiveness by timely provision of medical countermeasures in response to Joint Service Biological Warfare defense requirements.

CHARACTERISTICS/DESCRIPTION

- To provide individual level protection and prevent casualties by the use of medical countermeasures
- To provide diagnostics for biological threat agents
- To support the development of definitive care strategies for biological warfare agent casualties

CAPABILITY/IMPROVEMENTS

- Maintain technological capability to meet present biological defense requirements and counter future threats
- Provide enhanced diagnostic and medical management of biological casualties and enhanced survival

SPECIAL FEATURES

- Early diagnosis
- Rapid delivery of focused health care to casualties
- Develop new concepts for vaccines, pretreatments, antidotes, and therapeutic countermeasures for biological threat agents

CONTRACTORS

- SAIC, McLean, VA
- Battelle, Columbus, OH
- Univ of Cal, San Diego, CA
- John Hopkins University, Baltimore, MD
- University of Nebraska, Lincoln, NE

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	566.2	65.6	62.2	70.9	83.2	91.2	83.2	63.2	64.2	Cont.	Cont.
PROC											
TOTAL	566.2	65.6	62.2	70.9	83.2	91.2	83.2	63.2	64.2	Cont.	Cont.
QTY											

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	567.2	67.8	65.6	86.5	91.3	100.0	91.6	75.4	75.7	Cont.	Cont.
PROC											
TOTAL	567.2	67.8	65.6	86.5	91.3	100.0	91.6	75.4	75.7	Cont.	Cont.
QTY											
PGM Chg	1.0	2.2	3.4	15.7	8.0	8.8	8.4	12.2	11.5		

Notes

FY00 program changes due to OSD adjustments and release of congressionally directed funding for applied research and advanced technology development. FY01 program changes due to USAF operating agency change. FY02-07 increases due to FY02 POM increases. Remaining program changes are funding adjustments from PBD 289 Defense Wide Program PBD 604, Inflation, and PBD 741, Major Budget Issues.

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 0
Joint Acq Objective: 0
QTY Through FY07: 0

O&O/ORD

Unit	ORG	QTY

Fielding

- NA

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	None
Program Acq Cost	None
Quantity	None

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	1221.0
Procurement	0.0
Total Program	1221.0

Current Status

- **DOD POSITION**
  - The Medical Biological Defense Research Program is strongly supported by DoD as a Joint program as directed by Public Law 103-160 and is managed in accordance with the DoD Chemical and Biological Defense Management Plan.
- **FIELDING** - N/A
- **QUANTITY** - N/A
- **PROCUREMENT** - N/A
- **FMS** - N/A
- **MODIFICATIONS** - N/A
- **ISSUES** - N/A

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TBMDBIO - TECH BASE MEDICAL BIOLOGICAL

UNCLASSIFIED

Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE					25.0		13.5
Proc							
Total					25.0		13.5

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

SASC: Mr. Joe Sixeas
- No Language

SAC-D: Mr. John Young
- No Language

Conf
- No Language

Conf
- No Language

Notes

TB1 (Basic Research): Project funds basic research leading to the development of vaccines and therapeutic drugs to defend against validated biological threat agents including bacteria, toxins and viruses, as well as employing biotechnology to rapidly identify, diagnose, prevent and treat disease caused by exposure to biological threat agents.

TB2 (Applied Research): Project funds applied research leading to the development of vaccines, diagnostic capabilities and therapeutic drugs to defend against validated biological threat agents, including bacteria, toxins and viruses. Innovative biotechnological approaches and advances will be incorporated to obtain medical systems designed to rapidly identify, diagnose, prevent and treat disease due to exposure to biological threat agents.

TB3 (Adv Tech Dev): Project funds preclinical development research efforts leading to the development of safe and effective prophylaxes and therapies (vaccines and drugs) for pre- and post-exposure to biological threat agents. A broad range of technologies involved in targeting and delivery of prophylactic and therapeutic medical countermeasures and diagnostic systems is evaluated so that the most effective countermeasures are identified and brought forth for consideration as acquisition programs. Transitioning candidate vaccines, therapeutics and diagnostic technologies to Advanced Development requires the preparation of technical data packages to support the acquisition decision, the Food and Drug Administration (FDA) Investigational New Drug (IND) process, and DoD acquisition regulations.

Schedule

FY	98	99	00	01	02	03	04	05	06	07	08	09

TBNM BA1 - BASIC RESEARCH (JOINT)

UNCLASSIFIED

System Description

MISSION

- Funds basic research in chemistry, physics, mathematics, and life sciences fundamental information in support of new and improved detection technologies for biological agents and toxins. Research new and improved detection technologies for chemical threat agents, advanced concepts in individual and collective protection, new concepts in decontamination and information on the chemistry and toxicology of threat agents and related compounds.

CHARACTERISTICS/DESCRIPTION

CAPABILITY/IMPROVEMENTS

SPECIAL FEATURES

CONTRACTORS

- SAIC, McLean, VA
- Battelle, Columbus, OH
- Univ of Cal, San Diego, CA
- John Hopkins University, Baltimore, MD
- University of Nebraska, Lincoln, NE
- Maine Consortium (Senator Snowe)
- Purdue Univ, IN (Congressman Hostettler)
- University of South Carolina (Congressman Spence)

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	15.6	8.4	2.5	3.6	3.3	3.5	3.6	3.7	3.7	Cont.	Cont.
PROC											
TOTAL	15.6	8.4	2.5	3.6	3.3	3.5	3.6	3.7	3.7	Cont.	Cont.
QTY											

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	15.6	8.3	8.9	6.0	6.6	6.5	6.6	7.9	10.9	Cont.	Cont.
PROC											
TOTAL	15.6	8.3	8.9	6.0	6.6	6.5	6.6	7.9	10.9	Cont.	Cont.
QTY											
PGM Chg		(0.1)	6.5	2.4	3.3	3.0	3.0	4.2	7.2		

Notes
Prior update actuals. Congressional increase FY00.

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 0
Joint Acq Objective: 0
QTY Through FY07: 0

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	None
Program Acq Cost	None
Quantity	None

O&O/ORD

Unit	ORG	QTY

Fielding

- NA

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	77.2
Procurement	0.0
Total Program	77.2

Current Status

- **DOD POSITION** - N/A
- **FIELDING** - N/A
- **QUANTITY** - N/A
- **PROCUREMENT** - N/A
- **FMS** - N/A
- **MODIFICATIONS** - N/A
- **ISSUES** - N/A

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TBNM BA1 - BASIC RESEARCH (JOINT)

UNCLASSIFIED

Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE	2.5	7.0	7.5	9.2	9.5	7.5	9.2
Proc							
Total	2.5	7.0	7.5	9.2	9.5	7.5	9.2

HASC: Mr. Jean Reed
- No language

HAC-D: Mr. David Norquist
- See notes

SASC: Mr. Joe Sixeas
- No language

SAC-D: Mr. John Young
- See notes

Conf
- No language

Conf
- See notes

Notes

HAC - $1M only is for chemical and biological detection programs
HAC - $3M only is for chemical and biological point detectors

Special Information/Earmarks for Appropriated Funds:
CB Point Detectors - Purdue Univ, IN (Hostettler) $2.0M
CB Detection Programs - Maine Consortium (Senator Snowe) $3.5M
CB Detection Programs - University of South Carolina (Spence) $1.0M

Schedule

FY	98	99	00	01	02	03	04	05	06	07	08	09

TBNM BA2 - APPLIED RESEARCH (JOINT)

UNCLASSIFIED

System Description

MISSION

- Funds the urgent need to provide all services with defensive material to protect individuals and groups from threat chemical biological (CB) agents in the area of: detection; identification and warning; contamination avoidance through reconnaissance; individual and collective protection and decontamination. This project focuses on horizontal integration of CB defensive technologies across the Joint Services.

CHARACTERISTICS/DESCRIPTION

CAPABILITY/IMPROVEMENTS

SPECIAL FEATURES

CONTRACTORS

- NAIC: Medicine, VA
- Battelle, Columbus, OH
- Univ of Cal, San Diego, CA
- John Hopkins University, Baltimore, MD
- University of Nebraska, Lincoln, NE
- Purdue Univ, IN (Congressman Hostettler)
- Maine Consortium (Senator Snowe)
- Cleveland Clinic Foundation, Ohio (Congressman Dewine/Regula)
- Texas Consortium, TX

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	161.3	60.8	37.7	37.4	36.9	37.1	38.3	40.1	41.0	Cont.	Cont.
PROC											
TOTAL	161.3	60.8	37.7	37.4	36.9	37.1	38.3	40.1	41.0	Cont.	Cont.
QTY											

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	161.3	53.9	43.7	70.2	56.3	54.3	53.3	56.9	50.6	Cont.	Cont.
PROC											
TOTAL	161.3	53.9	43.7	70.2	56.3	54.3	53.3	56.9	50.6	Cont.	Cont.
QTY											
PGM Chg		(6.9)	5.9	32.7	19.5	17.3	15.0	16.8	9.6		

Notes
Prior update actuals. FY00 congressional increase and transfers-ins. FY01 PBD 203C Techbase Plus up.

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 0
Joint Acq Objective: 0
QTY Through FY07: 0

O&O/ORD

Unit	ORG	QTY

Fielding

- NA

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	None
Program Acq Cost	None
Quantity	None

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	600.4
Procurement	0.0
Total Program	600.4

Current Status

- **DOD POSITION** - N/A
- **FIELDING** - N/A
- **QUANTITY** - N/A
- **PROCUREMENT** - N/A
- **FMS** - N/A
- **MODIFICATIONS** - N/A
- **ISSUES** - N/A

TBNM BA2 - APPLIED RESEARCH (JOINT)

UNCLASSIFIED

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Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE	37.7	42.7	45.7	42.5	39.7	45.7	44.1
Proc							
Total	37.7	42.7	45.7	42.5	39.7	45.7	44.1

HASC: Mr. Jean Reed
- No language

HAC-D: Mr. David Norquist
- See notes

SASC: Mr. Joe Sixeas
- See notes

SAC-D: Mr. John Young
- See notes

Conf
- No language

Conf
- See notes

Notes

HASC: CBD, $5M increase
SASC: Hybird Sensor Suite, using thin film technology-$8M increase
Conference: Hybrid Sensor Suite, using thin film technology-$8M increase
HAC: Improved Weapons of Mass Destruction, $2M increase
SAC: Hybrid Sensor Suite, using thin film technology-$8M increase
Conference: $6.4M increase-$4.8M for Hybrid Sensor, $1.6M for Improved Weapons of Mass Destruction

Schedule

FY	98	99	00	01	02	03	04	05	06	07	08	09

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System Description

MISSION

- Funds technology advancements for Joint Services application in the areas of agent detection and identification, and individual/collective protection. This project will increase maturation of advanced technologies (ATD) to reduce risk in system-oriented Demonstration and Validation. This ATD will fabricate, demonstrate, and integrate advanced point and stand-off bio detection systems.

CHARACTERISTICS/DESCRIPTION

CAPABILITY/IMPROVEMENTS

SPECIAL FEATURES

CONTRACTORS

- SAIC; McLean,VA
- Battelle, Columbus, OH
- Univ of Cal, San Diego, CA
- John Hopkins University, Baltimore, MD
- University of Nebraska, Lincoln, NE
- Purdue Univ, IN (Congressman Hostettler)
- Maine Consortium (Senator Snowe)
- Cleveland Clinic Foundation, Ohio (Congressman Dewine/Regula)
- Texas Consortium

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	53.5	19.9	6.0	7.7	10.5	12.9	14.2	12.0	12.2	Cont.	Cont.
PROC											
TOTAL	53.5	19.9	6.0	7.7	10.5	12.9	14.2	12.0	12.2	Cont.	Cont.
QTY											

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	53.5	7.6	16.1	18.7	25.9	38.3	33.0	22.8	32.2	Cont.	Cont.
PROC											
TOTAL	53.5	7.6	16.1	18.7	25.9	38.3	33.0	22.8	32.2	Cont.	Cont.
QTY											
PGM Chg		(12.3)	10.1	11.0	15.4	25.4	18.9	10.8	20.0		

Notes

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 0
Joint Acq Objective: 0
QTY Through FY07: 0

O&O/ORD

Unit	ORG	QTY

Fielding

- NA

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	None
Program Acq Cost	None
Quantity	None

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	248.1
Procurement	0.0
Total Program	248.1

Current Status

- **DOD POSITION** - N/A
- **FIELDING** - N/A
- **QUANTITY** - N/A
- **PROCUREMENT** - N/A
- **FMS** - N/A
- **MODIFICATIONS** - N/A
- **ISSUES** - N/A

TBNM BA3 - ADV TECH DEV (JOINT)
UNCLASSIFIED

1 FEB 2001
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Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE	6.1	6.1	27.2	15.7	8.9	15.2	17.5
Proc							
Total	6.1	6.1	27.2	15.7	8.9	15.2	17.5

HASC: Mr. Jean Reed
- No language

HAC-D: Mr. David Norquist
- See notes

SASC: Mr. Joe Sixeas
- See notes

SAC-D: Mr. John Young
- See notes

Conf
- See notes

Conf
- See notes

Notes

SASC: $2.7M increase for CBIS, $6.4M increase for CMIS, $3.5M increase for CB advanced materiels research,
$8.5M for SUB-D
Conference: $2M increase for CBIS $4M increase for CMIS, $2.8M increase for CB advanced materiels research,
$750K for SUB-D
HAC: $800K increase for SUB-D, $2M increase for R&D
SAC: $2.7M increase for CBIS $6.4M increase for CMIS, $8.5M increase for SUB-D
Conference: $2M increase for CBIS, $4M increase for CMIS, $2.8M increase for CB advanced materiels research,
$800K for SUB-D, $1.8M increase for R&D

Schedule

FY	98	99	00	01	02	03	04	05	06	07	08	09

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System Description

MISSION

- Diagnostic tool to evaluate maturing technologies, prepare acquisition strategies and perform analyses of alternative technologies.

CHARACTERISTICS/DESCRIPTION

CAPABILITY/IMPROVEMENTS

SPECIAL FEATURES

CONTRACTORS

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE											
PROC											
TOTAL											
QTY											

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE			1.0	1.9	1.9	1.5	1.5				7.8
PROC											
TOTAL			1.0	1.9	1.9	1.5	1.5				7.8
QTY											
PGM Chg			1.0	1.9	1.9	1.5	1.5				7.8

Notes

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 0
Joint Acq Objective: 0
QTY Through FY07: 0

O&O/ORD

Unit	ORG	QTY

Fielding

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	None
Program Acq Cost	None
Quantity	None

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	7.8
Procurement	0.0
Total Program	7.8

Current Status

- **DOD POSITION** - N/A
- **FIELDING** - N/A
- **QUANTITY** - N/A
- **PROCUREMENT** - N/A
- **FMS** - N/A
- **MODIFICATIONS** - N/A
- **ISSUES** - N/A

ACTD PD - ACTD PLANNING AND DEVELOPMENT
UNCLASSIFIED

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Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE							
Proc							
Total							

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

SASC: Mr. Joe Sixeas
- No Language

SAC-D: Mr. John Young
- No Language

Conf
- No Language

Conf
- No Language

Notes

Schedule

FY	98	99	00	01	02	03	04	05	06	07	08	09

1 FEB 2001
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System Description

MISSION

- Refine capabilities to detect and identify biological agents.

CHARACTERISTICS/DESCRIPTION

CAPABILITY/IMPROVEMENTS

SPECIAL FEATURES

CONTRACTORS

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	15.8	2.9	2.7	3.5	6.6	1.4					32.9
PROC											
TOTAL	15.8	2.9	2.7	3.5	6.6	1.4					32.9
QTY											

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	15.7	2.8	1.8		2.4						22.6
PROC											
TOTAL	15.7	2.8	1.8		2.4						22.6
QTY											
PGM Chg	(0.2)		(0.9)	(3.5)	(4.2)	(1.4)					(10.3)

Notes

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 0
Joint Acq Objective: 0
QTY Through FY07: 0

O&O/ORD

Unit	ORG	QTY

Fielding

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	None
Program Acq Cost	None
Quantity	None

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	22.6
Procurement	0.0
Total Program	22.6

Current Status

- **DOD POSITION** - N/A
- **FIELDING** - N/A
- **QUANTITY** - N/A
- **PROCUREMENT** - N/A
- **FMS** - N/A
- **MODIFICATIONS** - N/A
- **ISSUES** - N/A

BIODET - BIODETECTION PROGRAM
UNCLASSIFIED

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Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE							
Proc							
Total							

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

SASC: Mr. Joe Sixeas
- No Language

SAC-D: Mr. John Young
- No Language

Conf
- No Language

Conf
- No Language

Notes

Schedule

FY	98	99	00	01	02	03	04	05	06	07	08	09

CTP(NS) - COUNTERPROLIFERATION SUPPORT (NON-SYSTEM)

UNCLASSIFIED

System Description

MISSION

- Provide to the warfighters near-term capabilities for early warning, detection, identification and characterization of biological warfare (BW) attacks; provide capabilities to restore operations of fixed site assets following a CW/BW attack

CHARACTERISTICS/DESCRIPTION

- Focus on ACTDs and critical technologies to support warning, id of BW/CW
- Accelerated development and rapid prototyping and field testing
- Focused transition of technology candidates to planned programs

CAPABILITY/IMPROVEMENTS

- Near-term interim capability
- Operational test and evaluation feedback for further refinement of technical and operational requirements
- Development/refinement of warfighting doctrine and defensive procedures

SPECIAL FEATURES

- Not constrained by traditional development process
- More active user involvement
- Direct CINC impact

CONTRACTORS

- Defense Group Inc., Rosslyn, VA
- METOne, OR
- SRI International, Menlo Park, CA
- Innovative Emergency Management, LA
- MIT (lab), MA

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	4.5	3.2	4.4	4.6	0.8	2.5	5.7	29.2	29.8	Cont.	Cont.
PROC											
TOTAL	4.5	3.2	4.4	4.6	0.8	2.5	5.7	29.2	29.8	Cont.	Cont.
QTY											

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	4.4	3.2	5.9	9.2	3.7	3.8	3.4	4.2	3.3	Cont.	Cont.
PROC											
TOTAL	4.4	3.2	5.9	9.2	3.7	3.8	3.4	4.2	3.3	Cont.	Cont.
QTY											

PGM Chg	(0.1)	1.5	4.5	2.9	1.4	(2.3)	(24.9)	(26.5)

Notes

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 0
Joint Acq Objective: 0
QTY Through FY07: 0

O&O/ORD

Unit	ORG	QTY

Fielding

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	None
Program Acq Cost	None
Quantity	None

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	41.1
Procurement	0.0
Total Program	41.1

Current Status

- **DOD POSITION**
  - Addresses shortfalls in deployed capability to defend against and counter the proliferation of Weapons of Mass Destruction (WMD).
- **FIELDING**
  - N/A
- **QUANTITY** - N/A
- **PROCUREMENT**
  - N/A
- **FMS**
  - N/A
- **MODIFICATIONS**
  - N/A
- **ISSUES**
  - N/A

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CTP(NS) - COUNTERPROLIFERATION SUPPORT (NON-SYSTEM)

UNCLASSIFIED

Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE							
Proc							
Total							

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

SASC: Mr. Joe Sixeas
- No Language

SAC-D: Mr. John Young
- No Language

Conf
- No Language

Conf
- No Language

Notes

Schedule

FY	98	99	00	01	02	03	04	05	06	07	08	09

EXECUTIVE SUMMARY PRODUCED BY JSCBIS

UNCLASSIFIED

LRBSDS - LONG RANGE BIO STAND-OFF (XM94) (LRBSDS)

UNCLASSIFIED

System Description

MISSION

- The LR-BSDS is an Army Corps level asset to provide early warning and aerosol cloud information to enhance contamination avoidance efforts and cue other biological detection assets (e.g., the Biological Integrated Detection System). Detection information from the LR-BSDS will be analyzed with other battlespace information and intelligence data to determine appropriate defensive measures.

CHARACTERISTICS/DESCRIPTION

- An integrated stand-off system consisting of a laser, receiver, telescope and computer processor mounted into a rigid frame

CAPABILITY/IMPROVEMENTS

- Eye safe at all ranges
- Increased range - 50-100KM
- Single Operator
- Stabilized platform
- Improved sensitivity and embedded training

SPECIAL FEATURES

- Platform - UH-60 Helicopter
- Detects on the move
- Infrared LIDAR technology
- Improved version has eye-safe laser

CONTRACTORS

- Schwartz Electro Optics, Orlando, FL
- Spectral Diode Labs, San Jose, CA
- Aspheric Technologies, Tampa, FL

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	40.8	5.5									46.3
PROC		1.9	11.7	11.8							25.4
TOTAL	40.8	7.4	11.7	11.8							71.7
QTY			3	3							6

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	42.2	6.5									48.7
PROC											
TOTAL	42.2	6.5									48.7
QTY											
PGM Chg	1.4	(0.9)	(11.7)	(11.8)							(23.0)

Notes
FY00 procurement funds long lead items.

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 24
Joint Acq Objective: 24
QTY Through FY07: 0

O&O/ORD

Unit	ORG	QTY
Co/Corps	USA	3

Fielding

- TBD

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	None
Program Acq Cost	None
Quantity	None

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	48.7
Procurement	0.0
Total Program	48.7

Current Status

- **DOD POSITION** - N/A
- **FIELDING** - N/A
- **QUANTITY**
  - Fielded 3 LR NDI to the 310th Chem Co (USARC) 4QFY96.
- **PROCUREMENT** - N/A
- **FMS**
  - None
- **MODIFICATIONS**
  - CP LR - stabilized platform, single operator and eye safe laser.
- **ISSUES**
  - Program will be restructured in the POM (Program Objective Memorandum) due to technical and funding issues.

LRBSDS - LONG RANGE BIO STAND-OFF (XM94) (LRBSDS)

UNCLASSIFIED

1 FEB 2001
SAAL-ZCS PAUL LANGE (703) 604-7245
DAMO-FDB COL IZZO (703) 695-3089

Congressional / OSD Issues

- None

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE							
Proc							
Total							

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

SASC: Mr. Joe Sixeas
- No Language

SAC-D: Mr. John Young
- No Language

Conf
- No Language

Conf
- No Language

Notes

The Long Range Biological Standoff Detection System (LR-BSDS) is used to detect, track and map large potential Biological Warfare (BW) aerosol clouds from a moving airborne UH06 platform. The program strategy was to develop and field an interim capability, the XM 94 Non-Developmental Item (NDI) system, and an objective capability, the couterproliferation (CP) XM94E1 RL-BSDS. The NDI system was Type Classified (Limited Procurement) in FY95, and thee systems fielded to the 310th Chemical Detachment, Fort McClellan, A, in FY96. Development of the CP system continued into FY00 when the Army withdrew support for the requirement. The CP program will be terminated in FY00. Future Plans currently envision develppmement of a Joint BSDS system commencing in FY03 to FY04 timeframe.

Schedule

FY	98	99	00	01	02	03	04	05	06	07	08	09
CP Engineering Development Tests		-										
In Process Review (IPR) CP LRBSDS			-									

System Description

MISSION

- Technologies within each of the commodity areas, decontamination, protection, contamination avoidance, and modeling and simulation will be applied as a means of keeping OPTEMPO up. Some will be applied before attack and remain in place (detectors and modeling and simulation), some will be used during an attack (protection), and others used after an attack (modeling and simulation, detectors, and decontamination). All of these will be appropriate for and demonstrated at an overseas Air Base. Some will be applicable at other fixed sites, APOD, SPOD, Communications, Logistics, and Medical fixed sites.

CHARACTERISTICS/DESCRIPTION

- Integrated Chem/Bio defense system for airports/seaports of debarkation
- Includes advanced detection, modeling and simulation, personnel and collective protection, and decontamination solutions

CAPABILITY/IMPROVEMENTS

- Development/refinement of warfighting doctrine and defense procedures
- Leave-behind integrated emergency management system for airports/seaports of debarkation (APOD/SPOD)
- CINC planning tools

SPECIAL FEATURES

- Integrated Emergency Management system for APOD/SPOD
- LIDAR Doppler Cloud Tracking
- New Decontaminates
- CINC Logistics Planning Tools

CONTRACTORS

- Innovative Emergency Management, Salt Lake City, UT
- Defense Group, Inc., Alexandria, VA

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	2.8	13.7	12.4	16.4	7.7	7.6					60.6
PROC											
TOTAL	2.8	13.7	12.4	16.4	7.7	7.6					60.6
QTY											

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	4.8	13.5	13.8	16.8	11.5	7.6					68.1
PROC											
TOTAL	4.8	13.5	13.8	16.8	11.5	7.6					68.1
QTY											
PGM Chg	1.9	(0.3)	1.4	0.4	3.9	0.1					7.4

Notes

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 0
Joint Acq Objective: 0
QTY Through FY07: 0

O&O/ORD

Unit	ORG	QTY

Fielding

- PACOM

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	None
Program Acq Cost	None
Quantity	None

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	68.1
Procurement	0.0
Total Program	68.1

Current Status

- **DOD POSITION** - N/A
- **FIELDING**
  - N/A
- **QUANTITY** - N/A
- **PROCUREMENT**
  - N/A
- **FMS**
  - N/A
- **MODIFICATIONS**
  - N/A
- **ISSUES**
  - None

RESTOPS - RESTOPS ACTD

UNCLASSIFIED

1 FEB 2001
SAAL-ZCS PAUL LANGE (703) 604-7245
DAMO-FDB COL IZZO (703) 695-3089

Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE							
Proc							
Total							

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

SASC: Mr. Joe Sixeas
- No Language

SAC-D: Mr. John Young
- No Language

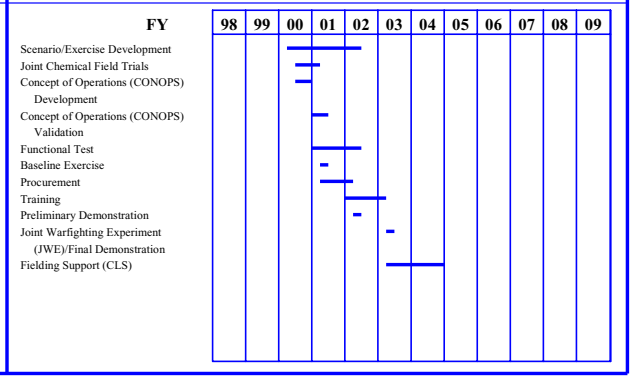
Conf
- No Language

Conf
- No Language

Notes

RestOps are those pre/during/post attack actions necessary to protect against, and then immediately react to, the consequences of a C/B attack on a port or airfield so that the facility can resume functioning with a minimum of down-time. The proposed RestOps ACTD will provide technology, software support and procedures so that a base/port commander can minimize the impact on military operations of a C/B attack.

Schedule



System Description

MISSION

- To enhance DoD personnel response capabilities to CB terrorism at all U.S. military installations .

CHARACTERISTICS/DESCRIPTION

- CB support to Joint Staff (J34) vulnerability assessments at select DoD installations
- Standards/guidelines/tools developed to prepare installations against WMD threat
- WMD training provided

CAPABILITY/IMPROVEMENTS

- Mitigation of CB terrorist attacks
- Reduction of casualties from CB

SPECIAL FEATURES

- Awareness tools (checklists, databases, interactive training software)
- "Best Practices"

CONTRACTORS

- Battelle (assessment support, training), OH
- Anser (MIP WMD Annex), VA
- ITA (interactive software tools), VA

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	6.1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	Cont.	Cont.
PROC											
TOTAL	6.1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	Cont.	Cont.
QTY											

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	6.1	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	Cont.	Cont.
PROC											
TOTAL	6.1	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	Cont.	Cont.
QTY											

PGM Chg

Notes

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 0
Joint Acq Objective: 0
QTY Through FY07: 0

O&O/ORD		
Unit	ORG	QTY

Fielding

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	None
Program Acq Cost	None
Quantity	None

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	10.0
Procurement	0.0
Total Program	10.0

Current Status

- **DOD POSITION**
  - Joint Staff (J34) is lead agency, PPD39 requirement. Program should be fully funded.
- **FIELDING**
  - N/A
- **QUANTITY** - N/A
- **PROCUREMENT**
  - No procurement anticipated.
- **FMS**
  - None
- **MODIFICATIONS**
  - None
- **ISSUES**
  - None

AT - ANTI-TERRORISM

UNCLASSIFIED

1 FEB 2001
SAAL-ZCS PAUL LANGE (703) 604-7245
DAMO-FDB COL IZZO (703) 695-3089

Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE							
Proc							
Total							

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

SASC: Mr. Joe Sixeas
- No Language

SAC-D: Mr. John Young
- No Language

Conf
- No Language

Conf
- No Language

Notes

Schedule

FY	98	99	00	01	02	03	04	05	06	07	08	09

CBAIMS - CHEM BIO ARCHIVE INFORMATION MGT SYS

UNCLASSIFIED

System Description

MISSION

- Provide relevant scientific and technological chemical biological documents to the CB community leveraging the CBIAC.

CHARACTERISTICS/DESCRIPTION

- CBAIMS is designed to improve the delivery of mission critical information products/services at lower cost
- Support the move of the US Army Chemical School to Fort Leonard Wood, MO
- Improve CBD materiel acquisition programs by reducing programmatic risk
- Provide one-stop access for FOIAs and Congressionals
- Minimize data duplication

CAPABILITY/IMPROVEMENTS

- Consolidated CBD data bases that allows CBD community access to wide variety of CBD scientific and technical documents

SPECIAL FEATURES

CONTRACTORS

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE		0.5	0.4	0.3	0.3	0.2	0.2	0.3	0.3	Cont.	Cont.
PROC											
TOTAL		0.5	0.4	0.3	0.3	0.2	0.2	0.3	0.3	Cont.	Cont.
QTY											

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	0.5	0.5	0.4	0.8	0.1	0.2	0.2	0.3	0.3	Cont.	Cont.
PROC											
TOTAL	0.5	0.5	0.4	0.8	0.1	0.2	0.2	0.3	0.3	Cont.	Cont.
QTY											

PGM Chg	0.5		0.4	(0.3)

Notes

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 0
Joint Acq Objective: 0
QTY Through FY07: 0

O&O/ORD

Unit	ORG	QTY

Fielding

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	None
Program Acq Cost	None
Quantity	None

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	3.3
Procurement	0.0
Total Program	3.3

Current Status

- **DOD POSITION** - N/A
- **FIELDING** - N/A
- **QUANTITY** - N/A
- **PROCUREMENT** - N/A
- **FMS** - N/A
- **MODIFICATIONS** - N/A
- **ISSUES**
  - Developed four phased process: collection identification, site characterization, preliminary document review, and processing.
  - Completed site characterization visits to six separate locations
  - Began preliminary document review at five sites including the US Army Chemical School, US Army West Desert Technical Information Center, US Naval Surface Warfare Center, Wright Patterson Air Force Base and the National Archives in College Park, MD

CBAIMS - CHEM BIO ARCHIVE INFORMATION MGT SYS

UNCLASSIFIED

1 FEB 2001
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DAMO-FDB COL IZZO (703) 695-3089

Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE							
Proc							
Total							

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

SASC: Mr. Joe Sixeas
- No Language

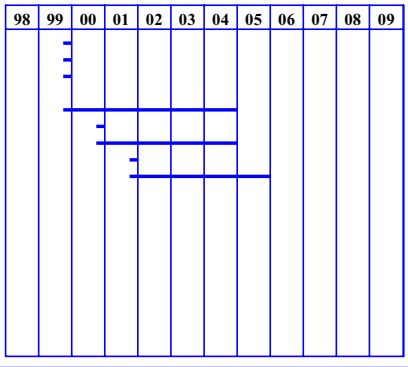
SAC-D: Mr. John Young
- No Language

Conf
- No Language

Conf
- No Language

Notes

Schedule



DPG - DUGWAY PROVING GROUND

UNCLASSIFIED

System Description

MISSION

- Sustainment of technical test capability at Dugway Proving Ground.

CHARACTERISTICS/DESCRIPTION

- Provides a technical capability for testing DoD CB Defense materiel, weapons and weapon systems from concept through production
- Finances indirect test operating costs not chargeable to test customers

CAPABILITY/IMPROVEMENTS

- N/A

SPECIAL FEATURES

- N/A

CONTRACTORS

- Lockheed Martin, Cherry Hill, NJ
- Andrulis Research Corp, Arlington, VA
- Radian International LLC, Oak Ridge, TN
- H.E. Cramer, Salt Lake City, UT

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	30.8	9.9	10.1	10.4	10.7	10.2	10.5	11.9	12.2	Cont.	Cont.
PROC											
TOTAL	30.8	9.9	10.1	10.4	10.7	10.2	10.5	11.9	12.2	Cont.	Cont.
QTY											

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	30.8	9.8	9.9	15.4	15.7	15.2	15.6	17.1	17.4	Cont.	Cont.
PROC											
TOTAL	30.8	9.8	9.9	15.4	15.7	15.2	15.6	17.1	17.4	Cont.	Cont.
QTY											
PGM Chg		(0.2)	(0.3)	5.0	5.1	5.0	5.1	5.2	5.2		

Notes

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 0
Joint Acq Objective: 0
QTY Through FY07: 0

O&O/ORD

Unit	ORG	QTY

Fielding

- NA

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	None
Program Acq Cost	None
Quantity	None

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	146.9
Procurement	0.0
Total Program	146.9

Current Status

- **DOD POSITION**
  - Program funded at a continuing level of effort.
- **FIELDING**
  - N/A
- **QUANTITY** - N/A
- **PROCUREMENT**
  - N/A
- **FMS**
  - N/A
- **MODIFICATIONS**
  - N/A
- **ISSUES**
  - N/A

EXECUTIVE SUMMARY PRODUCED BY JSCBIS

UNCLASSIFIED

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DPG - DUGWAY PROVING GROUND

UNCLASSIFIED

Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE							
Proc							
Total							

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

SASC: Mr. Joe Sixeas
- No Language

SAC-D: Mr. John Young
- No Language

Conf
- No Language

Conf
- No Language

Notes

The primary mission of Dugway Proving Ground is to plan, conduct, analyze, and report the results of technical tests and studies; especially in the areas of chemical defense, biological defense, incendiary, smoke and obscurant systems, and environmental technology testing.

Schedule

FY	98	99	00	01	02	03	04	05	06	07	08	09
Project Continuing												

EXECUTIVE SUMMARY PRODUCED BY JSCBIS

UNCLASSIFIED

JPT - JOINT & CINC OPERATIONAL TESTING

UNCLASSIFIED

System Description

MISSION

- Respond to requirements from the Services and Unified Combatant Commands (CINCs) for chemical and biological defense information and operationally oriented data and analysis.

CHARACTERISTICS/DESCRIPTION

- Plan, conduct, evaluate, and report on joint tests (for other than developmental hardware) and accomplish operational research assessments in response to requirements received from the Services and CINCs

CAPABILITY/IMPROVEMENTS

- N/A

SPECIAL FEATURES

- Quick method for developing operational techniques for already fielded items.

CONTRACTORS

- EAI Corporation, Abingdon, MD
- Midwest Research Institute, Kansas City, MO
- Southern Research Institute, Birmingham, AL

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	6.3	1.6	1.5	1.7	1.7	1.7	1.8	1.9	2.0	Cont.	Cont.
PROC											
TOTAL	6.3	1.6	1.5	1.7	1.7	1.7	1.8	1.9	2.0	Cont.	Cont.
QTY											

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	6.3	1.5	1.5	3.0	3.0	3.0	3.0	3.0	3.0	Cont.	Cont.
PROC											
TOTAL	6.3	1.5	1.5	3.0	3.0	3.0	3.0	3.0	3.0	Cont.	Cont.
QTY											
PGM Chg				1.3	1.3	1.3	1.2	1.1	1.1		

Notes

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 0
Joint Acq Objective: 0
QTY Through FY07: 0

O&O/ORD

Unit	ORG	QTY

Fielding

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	None
Program Acq Cost	None
Quantity	None

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	27.4
Procurement	0.0
Total Program	27.4

Current Status

- **DOD POSITION**
  - Program funded at a continuing level of effort.
- **FIELDING**
  - N/A
- **QUANTITY** - N/A
- **PROCUREMENT**
  - N/A
- **FMS**
  - N/A
- **MODIFICATIONS**
  - N/A
- **ISSUES**
  - N/A

EXECUTIVE SUMMARY PRODUCED BY JSCBIS

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SAAL-ZCS PAUL LANGE (703) 604-7245
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JPT - JOINT & CINC OPERATIONAL TESTING

UNCLASSIFIED

Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE							
Proc							
Total							

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

SASC: Mr. Joe Sixeas
- No Language

SAC-D: Mr. John Young
- No Language

Conf
- No Language

Conf
- No Language

Notes

Schedule

FY	98	99	00	01	02	03	04	05	06	07	08	09
Project Continuing												

EXECUTIVE SUMMARY PRODUCED BY JSCBIS

UNCLASSIFIED

JSIG DT - JSIG DOCTRINE AND TRAINING

UNCLASSIFIED

System Description

MISSION

CHARACTERISTICS/DESCRIPTION

CAPABILITY/IMPROVEMENTS

SPECIAL FEATURES

CONTRACTORS

Program Funding ($M)

FY01 PB

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	1.9	2.1	2.1	2.1	2.1	2.2	2.3	3.9	4.0	Cont.	Cont.
PROC											
TOTAL	1.9	2.1	2.1	2.1	2.1	2.2	2.3	3.9	4.0	Cont.	Cont.
QTY											

FY02 PB "B"

	Prior	00	01	02	03	04	05	06	07	CTC	Total
RDTE	1.9	3.2	3.1	3.3	3.4	3.4	3.5	6.1	6.3	Cont.	Cont.
PROC											
TOTAL	1.9	3.2	3.1	3.3	3.4	3.4	3.5	6.1	6.3	Cont.	Cont.
QTY											
PGM Chg		1.1	1.1	1.2	1.2	1.2	1.3	2.3	2.3		

Notes

Requirements & System Cost

QUANTITY REQUIREMENTS

2 MTW: 0
Joint Acq Objective: 0
QTY Through FY07: 0

O&O/ORD

Unit	ORG	QTY

Fielding

SYSTEM COST DATA

SYSTEM COSTS	TY $ ($K)
Procurement Cost	None
Program Acq Cost	None
Quantity	None

TOTAL PROGRAM OVER FYDP

PROGRAM	TY $ ($M)
RDTE	34.3
Procurement	0.0
Total Program	34.3

Current Status

- **DOD POSITION** - N/A
- **FIELDING** - N/A
- **QUANTITY** - N/A
- **PROCUREMENT** - N/A
- **FMS** - N/A
- **MODIFICATIONS** - N/A
- **ISSUES** - N/A

JSIG DT - JSIG DOCTRINE AND TRAINING

UNCLASSIFIED

1 FEB 2001
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DAMO-FDB COL IZZO (703) 695-3089

Congressional / OSD Issues

- **None**

Congressional Track

($M)	Authorization				Appropriation		
	Request	HASC	SASC	Conf	HAC	SAC	Conf
RDTE							
Proc							
Total							

HASC: Mr. Jean Reed
- No Language

HAC-D: Mr. David Norquist
- No Language

SASC: Mr. Joe Sixeas
- No Language

SAC-D: Mr. John Young
- No Language

Conf
- No Language

Conf
- No Language

Notes

Schedule

FY	98	99	00	01	02	03	04	05	06	07	08	09

APPENDIX F:

MEDICAL TECHNOLOGY AND DEVELOPMENT DESCRIPTIVE SUMMARIES (SMART CHARTS)

(FY02 President's Budget)

LIST OF PROGRAMS

(DTO AND NON-DTO TECHNOLOGY EFFORTS)

DTO TECHNOLOGY EFFORTS

NON-DTO TECHNOLOGY EFFORTS

ACTIVE TOPICAL SKIN PROTECTANT II (aTSP)

UNCLASSIFIED

DTO TECHNOLOGY EFFORT

Service/Agency POC:	USD(AT&L) POC :	Customer POC:
Carol D. Linden, Ph.D.	Dr. Anna Johnson-Winegar	COL John E. Ball, USA
Research Area Director	DATSD (CBD)	MPSP, JSIG
(301) 619-7439	(703) 693-9410	(210) 221-1055

OBJECTIVES

- Increase the protection offered by the Skin Exposure Reduction Paste against Chemical Warfare Agents (SERPACWA), the licensed topical skin protectant (TSP), by incorporating an active moiety that will neutralize nerve agents and sulfur mustard (HD). This active moiety must be compatible with SERPACWA and not be irritating to the skin.

CHALLENGES

- Develop active moieties that are not irritating to the skin.
- Develop active moieties that are catalytic and not limited by stoichiometry.
- Develop suitable evaluation models.
- Extrapolate efficacy test results from animals to man.

Schedule	FY00	FY01	FY02
Initiate formulation studies			
Demonstrate efficacy of formulation			
Complete formulation studies			
Transfer aTSP formulation to advanced development			

STATUS

Budget	G
Schedule	G
Tech Perf	G
Relevance	G

Planned Funding $ in Millions

	FY00	FY01	FY02
0602384BP	0.0	0.0	0.0
0603384BP	0.4	2.1	2.1
Total	0.4	2.1	2.1

G - Green
A - Amber
R - Red

UNCLASSIFIED

CHEMICAL AGENT PROPHYLAXIS II

UNCLASSIFIED

DTO TECHNOLOGY EFFORT

Service/Agency POC:	USD(AT&L) POC :	Customer POC:
Carol D. Linden, Ph.D.	Dr. Anna Johnson-Winegar	COL John E. Ball, USA
Research Area Director	DATSD (CBD)	MPSP, JSIG
(301) 619-7439	(703) 693-9410	(210) 221-1055

OBJECTIVES

- Demonstrate improved medical protection against nerve agents.
- Develop a prophylactic that detoxifies nerve agents at a rate sufficient to protect against $5LD_{50}$ exposure.
- Prophylactic should be non-toxic, produce no adverse side effects, have no adverse effect on performance, be easy to administer, and have a long biological half-life.

CHALLENGES

- Development of effective prophylactics devoid of side effects,
- Development of circulating scavengers with extended half-lives,
- Development of suitable animal models,
- Production of sufficient material for safety and efficacy studies,
- Extrapolation of animal efficacy test results to man.

Schedule	FY00	FY01	FY02
Transition to Concept Exploration			
Develop transgenic models			
Examine autoimmune issues			
Transition to Advanced Development			

STATUS

Budget	G
Schedule	G
Tech Perf	G
Relevance	G

Planned Funding $ in Millions

	FY00	FY01	FY02
0602384CP	1.3	1.2	1.0
0603384CP	0.6	0.7	1.0
Total	1.9	1.9	2.0

G - Green
A - Amber
R - Red

COMMON DIAGNOSTIC SYSTEMS FOR BIOLOGICAL THREATS & ENDEMIC INFECTIOUS DISEASES

UNCLASSIFIED

DTO TECHNOLOGY EFFORT

Service/Agency POC:	USD(AT&L) POC :	Customer POC:
Carol D. Linden, Ph.D.	Dr. Anna Johnson-Winegar	COL John E. Ball, USA
Research Area Director	DATSD (CBD)	MPSP, JSIG
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OBJECTIVES

- Develop state-of-the-art technologies capable of supporting rapid identification of BW and endemic infectious disease agents in clinical specimens.
- Devices will be used by medical personnel to support the surveillance, monitoring and diagnosis of disease.
- Current focus on portable gene amplification technology for detection and identification of nucleic acids.

CHALLENGES

- Development of rapid processing methods that can be used with a broad array of possible clinical specimens (I.e., whole blood, sputum, swabs, feces, and tissues).
- Development of identification technologies and reagents of sufficient sensitivity and specificity to support early disease diagnosis.
- Reduction of macro laboratory methods to portable devices

Schedule	FY00	FY01	FY02
Develop portable device to detect nucleic acid			
Transition portable device to advanced development			

Planned Funding $ in Millions

	FY00	FY01	FY02
0602384BP	0.6	1.2	1.0
0603384BP	1.0	0.7	1.0
Army ID	0.3	1.9	2.0
DARPA	2.0	1.0	0.0
Total	3.9	3.0	2.0

STATUS

Budget	G
Schedule	G
Tech Perf	G
Relevance	G

G - Green
A - Amber
R - Red

MEDICAL COUNTERMEASURES FOR BRUCELLA

UNCLASSIFIED

UNCLASSIFIED

DTO TECHNOLOGY EFFORT

Service/Agency POC:	USD(AT&L) POC :	Customer POC:
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Research Area Director	DATSD (CBD)	MPSP, JSIG
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OBJECTIVES

- Develop a genetically characterized live attenuated vaccine that elicits cellular and humoral immunity against Brucella and protects 90% of individuals against disease after aerosol challenge

CHALLENGES

- Defining appropriate in vitro correlates of protective immunity
  - Defining the best criteria for demonstration of efficacy
  - Selecting a vaccine candidate with the most advantageous immunogenicity/virulence ratio.

Schedule	FY01	FY02	FY03
Aerosol lethality/efficacy			
Cross-protection			
Tech data package			

Planned Funding $ in Millions

	FY01	FY02	FY03
0602384BP	0.4	0.4	0.4
0603384BP	1.4	1.6	1.7
Total	1.8	2.0	2.1

STATUS

Budget	G
Schedule	G
Tech Perf	G
Relevance	G

G - Green
A - Amber
R - Red

MEDICAL COUNTERMEASURES FOR ENCEPHALITIS VIRUSES

UNCLASSIFIED

DTO TECHNOLOGY EFFORT

Service/Agency POC:	USD(AT&L) POC :	Customer POC:
Carol D. Linden, Ph.D.	Dr. Anna Johnson-Winegar	COL John E. Ball, USA
Research Area Director	DATSD (CBD)	MPSP, JSIG
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OBJECTIVES

- Develop vaccines against the Biological Warfare (BW) threat of the equine encephalitis viruses
- Need to protect against five different viruses:
  - -Venezuelan equine encephalitis (VEE)
    - VEE IA/B
    - VEE IE
    - VEE IIIA
  - -Eastern equine encephalitis (EEE)
  - -Western equine encephalitis (WEE)
- Exploit recombinant vaccine technology to provide effective vaccine components to be delivered as a "Multivalent Equine Encephalitis Vaccine"

CHALLENGES

- Complete full-length infectious clone approach for VEE IIIA virus
- Identify attenuating mutations to engineer into full-length infectious clones that provide viable vaccine candidates and preserve the protective epitopes (EEE and WEE)

Schedule	FY00	FY01	FY02	FY03
Complete analogous EEE and VEE IIIA vaccines				
Complete safety and efficacy testing in NHP				
Transition VEE multivalent vaccine				
Transition combined vaccine (VEE IA-B/VEE IE/VEE IIIA/WEE/EEE				

STATUS	
Budget	G
Schedule	G
Tech Perf	G
Relevance	G

Planned Funding $ in Millions

	FY00	FY01	FY02	FY03
0602384BP	0.5	0.7	0.2	0.2
0603384BP	0.6	0.6	0.8	0.8
Total	1.1	1.3	1.0	1.0

G - Green
A - Amber
R - Red

UNCLASSIFIED

MEDICAL COUNTERMEASURES FOR VESICANT AGENTS II

UNCLASSIFIED

DTO TECHNOLOGY EFFORT

Service/Agency POC:	USD(AT&L) POC :	Customer POC:
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Research Area Director	DATSD (CBD)	MPSP, JSIG
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OBJECTIVES

- Prevent or decrease the severity of injuries caused by vesicant chemical agents, focusing principally on sulfur mustard.

CHALLENGES

- Development of therapeutic measures with minimal side effects.
- Demonstrating safety and efficacy.
- Developing formulations.
- Extrapolation to man of animal efficacy test results.

Schedule	FY01	FY02	FY03
Acquire Compounds			
Efficacy Studies			
Safety Assessment			
Pharmacokinetics			
Characterize Product			
Evaluate Formulations			
Initial Downselect			

STATUS	
Budget	G
Schedule	G
Tech Perf	G
Relevance	G

Planned Funding $ in Millions

	FY01	FY02	FY03
0602384BP	3.0	2.5	1.0
0603384BP	2.0	2.5	4.0
Total	5.0	5.0	5.0

G - Green
A - Amber
R - Red

MULTIAGENT VACCINE FOR BW THREAT AGENTS

UNCLASSIFIED

DTO TECHNOLOGY EFFORT

Service/Agency POC:	USD(AT&L) POC :	Customer POC:
Carol D. Linden, Ph.D.	Dr. Anna Johnson-Winegar	COL John E. Ball, USA
Research Area Director	DATSD (CBD)	MPSP, JSIG
(301) 619-7439	(703) 693-9410	(210) 221-1055

OBJECTIVES

- Produce vaccine delivery platforms that can concurrently immunize an individual against a range of biological warfare threats.
- Achieve vaccines directed against multiple agents using bioengineering and recombinant vaccine technologies (naked DNA vaccines or replicon vaccines) that exploit the use of the same basic construct

CHALLENGES

- Scale-up production issues for VEE replicon platform
- VEE replicon vaccine efficacy in light of pre-existing VEE immunity
- Enhancing immunogenicity of DNA vaccines
- Evaluation of potential vaccine interference effects
- Stimulating different protective immune responses (i.e., TH1 vs TH2) in a single vaccine platform

Schedule	FY00	FY01	FY02
Evaluation of immunogenicity/identify final agents			
Test efficacy of products			
Demonstrate multiagent vaccine platform proof-of-principle			

Planned Funding $ in Millions

	FY00	FY01	FY02
0602384BP	0.6	1.0	0.3
0603384BP	0.5	0.9	1.7
DARPA	1.0	1.0	1.0
Total	2.1	2.9	3.0

STATUS

Budget	G
Schedule	G
Tech Perf	G
Relevance	G

G - Green
A - Amber
R - Red

UNCLASSIFIED

NEEDLELESS DELIVERY METHODS FOR RECOMBINANT PROTEIN VACCINES

UNCLASSIFIED

DTO TECHNOLOGY EFFORT

Service/Agency POC:	USD(AT&L) POC :	Customer POC:
Carol D. Linden, Ph.D.	Dr. Anna Johnson-Winegar	COL John E. Ball, USA
Research Area Director	DATSD (CBD)	MPSP, JSIG
(301) 619-7439	(703) 693-9410	(210) 221-1055

OBJECTIVES

- To induce mucosal and systemic immune responses to threat agents.
- To develop alternatives to the injection of recombinant protein based vaccines.

CHALLENGES

- Developing animal models indicative of the human response. Defining quantifiable immunological end-points indicative of protection.
- Producing stable formulations of vaccines for respiratory, transdermal, or oral delivery.
- Selecting the most practical and efficacious route of administration to produce both mucosal and systemic immunity.
- Protection of vaccinated individuals from both lethal and incapacitating toxin challenges

Schedule	FY01	FY02	FY03	FY04	FY05
Identify delivery platforms/standardize assays/models.					
Optimize mode and formulation for delivery application					
Demonstrate efficacy of needle-free monovalent vaccines					
Prototypes single or combination needle-free vaccines					
Prototype/complete required					

Planned Funding $ in Millions

	FY01	FY02	FY03	FY04	FY05
0602384BP	0.6	0.6	0.6	0.0	0.0
0603384BP	0.9	1..2	1.1	1.7	1.7
Total	1.5	1.8	1.7	1.7	1.7

STATUS

Budget	G
Schedule	G
Tech Perf	G
Relevance	G

G - Green
A - Amber
R - Red

RECOMBINANT PLAGUE VACCINE

UNCLASSIFIED

DTO TECHNOLOGY EFFORT

Service/Agency POC:	USD(AT&L) POC :	Customer POC:
Carol D. Linden, Ph.D.	Dr. Anna Johnson-Winegar	COL John E. Ball, USA
Research Area Director	DATSD (CBD)	MPSP, JSIG
(301) 619-7439	(703) 693-9410	(210) 221-1055

OBJECTIVES

- Complete pre-clinical development of the recombinant F1-V fusion protein plague vaccine candidate.

CHALLENGES

- Identifying the most appropriate in vitro correlates of protective immunity against aerosolized plague.
- Establishing a surrogate efficacy model for F1-V immunity.
- Time required to assess the duration of protection offered by the F1-V vaccine candidate.

Schedule	FY01	FY02
Complete Phase 0 exit criteria studies		
Duration of immunity in NHPs and range of protection studies		

STATUS

Budget	G
Schedule	G
Tech Perf	G
Relevance	G

Planned Funding $ in Millions

	FY01	FY02
0602384BP	0.2	0.2
0603384BP	0.7	0.9
Total	0.9	1.1

G - Green
A - Amber
R - Red

UNCLASSIFIED

RECOMBINANT PROTECTIVE ANTIGEN ANTHRAX VACCINE CANDIDATE

UNCLASSIFIED

DTO TECHNOLOGY EFFORT

Service/Agency POC:	USD(AT&L) POC :	Customer POC:
Carol D. Linden, Ph.D.	Dr. Anna Johnson-Winegar	COL John E. Ball, USA
Research Area Director	DATSD (CBD)	MPSP, JSIG
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OBJECTIVES

- Characterize a recombinant protective antigen (rPA) anthrax vaccine, including preliminary development of an appropriate in vitro correlate of induced protective immunity against *B. anthracis* aerosol exposure.

CHALLENGES

- Time required for expanded animal efficacy studies comparing AVA with rPA
- Demonstrating surrogate efficacy against *B. anthracis* aerosol challenge with antibody to rPA alone

Schedule	FY01	FY02
Complete tech data package supporting transition		
Efficacy in NHP and passive transfer studies		

STATUS

Budget	G
Schedule	G
Tech Perf	G
Relevance	G

Planned Funding $ in Millions

	FY01	FY02
0602384BP	0.5	0.5
0603384BP	0.8	1.5
Total	1.3	2.0

G - Green
A - Amber
R - Red

MEDICAL COUNTERMEASURES FOR STAPHYLOCOCCAL ENTEROTOXINS (SEs)

UNCLASSIFIED

DTO TECHNOLOGY EFFORT

Service/Agency POC:	USD(AT&L) POC :	Customer POC:
Carol D. Linden, Ph.D.	Dr. Anna Johnson-Winegar	COL John E. Ball, USA
Research Area Director	DATSD (CBD)	MPSP, JSIG
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OBJECTIVES

- Develop medical countermeasures against the BW threat of SEs.
- Exploit recombinant vaccine technology to provide effective candidates that may be safer and more affordable to manufacture than traditional vaccines.

ACCOMPLISHMENTS

- Scalable GMP purification process for SE recombinant vaccine candidates
- Working cell banks and reference standards for the recombinant serotype A candidate
- Preclinical assays for biological potency, formulation, and stability
- Neutralizing antibody response as a surrogate endpoint of clinical efficacy
- Recommended dosing and scheduling for human clinical trials

Schedule	FY00
Evaluate Vaccine Candidate	

STATUS

Budget	G
Schedule	G
Tech Perf	A
Relevance	G

Planned Funding $ in Millions

	FY00
0602384BP	0.0
0603384BP	1.9
Total	1.9

G - Green
A - Amber
R - Red

UNCLASSIFIED

MEDICAL COUNTERMEASURES FOR FILOVIRUSES

UNCLASSIFIED

NON-DTO TECHNOLOGY EFFORT

Service/Agency POC:	USD(AT&L) POC :	Customer POC:
Carol D. Linden, Ph.D.	Dr. Anna Johnson-Winegar	COL John E. Ball, USA
Research Area Director	DATSD (CBD)	MPSP, JSIG
(301) 619-7439	(703) 693-9410	(210) 221-1055

OBJECTIVES

- By FY2001, transition to advanced development vaccine candidates that will protect 90% or greater of immunized individuals from lethal aerosol challenge of Marburg and Ebola viruses.
- By FY2001, evaluate immunoglobulin/monoclonal antibodies for passive immunization regimens for short-term protection and treatment.
- By FY2001, evaluate antiviral compounds for effectiveness in short-term protection and treatment.

CHALLENGES

- Develop appropriate animal model systems and surrogate markers for investigational purposes and for licensure.
- Identify appropriate immunogens/vaccine platform for use as filovirus vaccine candidates.
- Broad spectrum efficacy of antiviral drugs.

Schedule	FY00	FY01
Evaluate immunoglobulins		
Evaluate antiviral drugs		
Develop vaccine candidates		
Evaluate vaccine candidates		

STATUS

Budget	G
Schedule	A
Tech Perf	A
Relevance	G

Planned Funding $ in Millions

	FY00	FY01
0602384BP	1.0	1.0
0603384BP	2.0	2.0
Total	3.0	3.0

G - Green
A - Amber
R - Red

Service/Agency POC:	USD(AT&L) POC :	Customer POC:
Carol D. Linden, Ph.D.	Dr. Anna Johnson-Winegar	COL John E. Ball, USA
Research Area Director	DATSD (CBD)	MPSP, JSIG
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OBJECTIVES

- Develop medical countermeasures against the BW threat of variola, the causative agent of smallpox.

CHALLENGES

- Develop appropriate surrogate markers for investigational purposes.
- Broad spectrum efficacy of antiviral drugs.
- Identify appropriate immunogens for future vaccine approaches.
- Use of a surrogate agent in a surrogate animal model in the licensure process

Schedule	FY00	FY01
Evaluate existing vaccines		
Identify potential treatments		
Acquire diagnostic techniques		
Identify effective antiviral drugs		

STATUS	
Budget	G
Schedule	G
Tech Perf	G
Relevance	G

Planned Funding $ in Millions

	FY00	FY01
0602384BP	0.3	0.3
0603384BP	0.3	0.3
Total	0.6	0.6

G - Green
A - Amber
R - Red

UNCLASSIFIED **NON-DTO TECHNOLOGY EFFORT**

Service/Agency POC:	USD(AT&L) POC :	Customer POC:
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OBJECTIVES

CHALLENGES

This Descriptive Summary is Intentionally Left Blank

STATUS	
Budget	G
Schedule	G
Tech Perf	G
Relevance	G

Planned Funding $ in Millions

G - Green
A - Amber
R - Red

APPENDIX G:

FUNDING DATA

(FY02 President's Budget)

THIS ADMINISTRATION HAS NOT YET ADDRESSED FY03-07 REQUIREMENTS. PLANS FOR DETAILED FUNDING REQUIREMENTS BEYOND FY02 WILL BE CONSIDERED BY THE ADMINISTRATION DURING THE FY03-07 DEFENSE PROGRAM DEVELOPMENT PROCESS.

APPENDIX H:

2 MTW REQUIREMENTS

(FY02 President's Budget)

APPENDIX I:

JOINT SERVICE NBC DEFENSE COMMUNITY POINTS OF CONTACT